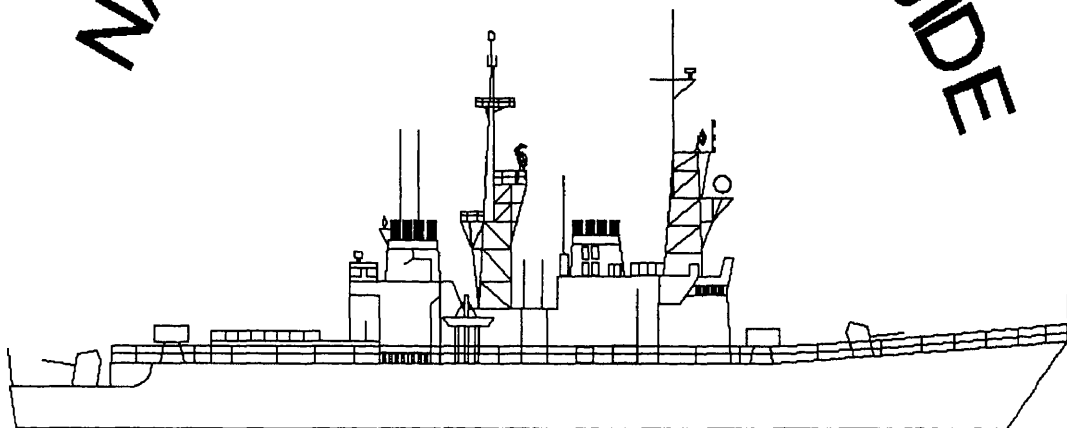


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NAVOSH TRAINING GUIDE



FOR FORCES AFLOAT

NAVY OCCUPATIONAL SAFETY AND HEALTH (NAVOSH)
TRAINING GUIDE FOR FORCES AFLOAT

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- I. SAMPLE TRAINING REQUIREMENTS PAGES (TRP'S)

MARCH 1991

. INTRODUCTION

The objective of this NAVOSH Training Guide For Forces Afloat is to provide an effective and efficient means of meeting AVOSH training goals. OPNAVINST 5100.19B, NAVOSH Program Manual for Forces Afloat, defines required safety training subjects and periodicities. This guide consolidates occupational health and safety subject matter into generic lesson guides, complete with quizzes and handouts. It also provides lists of available training aids and videotapes, formal course information, a sample long range training plan, references, and a technical assistance guide. A Training Requirements Page (TRP) is also included for all applicable lesson guides, as required by COMSUBLANT/COMSUBPACINST C3500.1 - COMSUBLANT/COMSUBPAC Training Manual.

Safety and occupational health training should be part of our Command Training Plan, and be included in the long range training plan for your ship as General Military Training (GMT).

Instructors for these lesson guides should be E-5 or above, preferably Safety Petty Officers or Medical Department representatives. The instructor does not have to be a subject-matter expert.

These lesson guides cover general safety and health topics, but do not include the specific safety lectures required before special evolutions or operations such as weapons handling and refueling. You may tailor these lectures to your command's specific requirements.

Training assistance is available from your local tender or repair ship Safety Department. More information on lesson guide content or references can be obtained by contacting the Naval Safety Center, Surface Ship Directorate, Occupational Health Branch, at (804) 444-7233 or autovon 564-7233.

ACKNOWLEDGEMENTS:

This training manual was originally developed by the Safety Department on USS L. Y. SPEAR (AS-36). We would like to thank the following people for their contributions:

LCDR Charlene Brassington, MSC, USN
ICC(SS) George Collison, USN
MR1(SW) Wayne Sutton, USN

B. NAVOSH/SAFETY TRAINING REQUIREMENTS

Reference: OPNAVINST 3120.32B
OPNAVINST 5100.19B, Appendix A7-C
OPNAVINST 5101.25A

The following NAVOSH topics must be presented to all hands upon reporting aboard (usually during I-Division):

Occupational Safety and Health Program
(including Back Injury Prevention)
Electrical Safety
Tag-out Program
Radiation Hazards

Training must be provided on the following NAVOSH topics prior to assignment to an applicable job or area, and annually thereafter:

<u>TOPIC</u>	<u>APPLICABLE AUDIENCE</u>
Asbestos Hazards	Workers where asbestos is present
CPR Training	All electronic/electrical ratings, all Gas Free Engineering personnel
Electrical Tool Issue Program	Assigned as tool issue worker
Gas Free Engineering	Assigned personnel, Gas Free Engineering Petty Officer
Hazardous Materials	All hands, job-specific
Hazardous Materials Handling	All supply personnel
Hazardous Materials Program	All supervisors
Hazardous Material Spill Response	Damage control parties
Hazardous Waste Transfer	All supply personnel
Hearing Conservation	Workers in noise hazardous areas
Heat Stress	Workers in potential heat stress areas
Heat Stress Monitoring	Designated heat stress monitors

TOPICAPPLICABLE AUDIENCE

Lead Hazards	Workers with potential exposure
Personal Protective Equipment Program	All workers using/required to wear PPE
Radio-Frequency Radiation (RFR) Hazards	All personnel working in area of potential exposure above permissible limit
Recreation, Athletics and Home Safety	All hands quarterly training
Respiratory Protection	Workers prior to respirator use
Respirator Selection/ Care/Maintenance	Issuer of respiratory protection
Sight Conservation	Workers in eye hazardous areas
Tag-Out Procedures	Workers assigned to Tag-Out duties; Tag-Out authorizing officer

Indoctrination training may be extended to cover other subjects as desired. Topic training is required for personnel exposed to certain hazards, but may be expanded to include other crew members. For example, hearing conservation training is highly recommended for all hands, especially prior to yard and upkeep periods.

C. SAMPLE SHIP'S LONG RANGE TRAINING PLAN

OPNAVINST 3120.32B, Standard Organization and Regulations Manual, requires each command to develop a Long Range Training Plan. The following sample LRTP outlines annual safety and occupational health training requirements from OPNAVINST 5100.19B, Chapter A7 and OPNAVINST 5100.25A. This is only a sample with the minimum requirements, and each command should tailor it to conform to operational schedules and upkeeps. Required annual training topics for all hands are marked with an asterisk. Other topics are specific to the job or potential exposure to the hazard.

TRAINING TOPIC	COG DEPT	QUARTER			
		1ST	2ND	3RD	4TH
Asbestos Hazards	MED			X	
Back Injury Prevention	MED		X		
CPR Training	MED			X	
*Electrical Safety	E-DIV		X		
Gas-Free Engineering	DCA	X			
Hazardous Material/ Hazardous Waste Program	SUP/SAF OFF				X
Hazardous Material Spill Response	DCA	X			
Hearing Conservation	MED	X			
Heat Stress	MED/ENG		X		
*Home/Recreation/Athletic Safety Program	SAF OFF	X	X	X	X
Lead Safety	MED		X		
*NAVOSH Program	SAF OFF				X
Personal Protection (PPE)	SAF OFF	X			
*Radiation Hazards	MED			X	
Respiratory Protection	SAF OFF		X		
RFR Hazards	COMM OFF				X
Sight Conservation	SAF OFF			X	
*Tag-Out	E-DIV				X
*Safety Briefs (2/MO)	DIV OFF/LPO	X	X	X	X

* Required annual training for all hands.

Frequency of presentations and topics may be increased at command discretion. Other job specific topics may be required for different ship types, or be required by the Type Commander.

The ship's Long Range Training Plan should be compared with the current COMNAVSURFLANT Master Training Plan, COMNAVSURFPAC TF-STAR, COMSUBLANT/COMSUBPAC Training Manual, and the COMNAVAIRLANT and COMNAVAIRPAC Training Manual which may have additional safety training requirements.



D. TRAINING AIDS LISTING

NAVOSH Training Aids are listed in OPNAVINST 5100.19B Appendix A7-F and OPNAV P-09B1-01-88, Catalog of Navy/Marine Corps Audiovisual Productions. Audiovisual products are available on a temporary loan basis from the commands listed below. Temporary loan requests must be submitted in writing citing the identification number, title, format, loan period, command UIC, and the ship's point of contact.

Naval Education and Training Support Center, Atlantic
Code N5, Bldg W313
Naval Station, Norfolk, VA 23511-6197
Phone (804) 444-4011/1468, Autovon 564-4011/1468

Naval Education and Training Support Center, Pacific
921 West Broadway
San Diego, CA 92132-1360
Phone (619) 532-1360, Autovon 522-1360

In some instances, training aids may also be borrowed from the Industrial Hygiene or Occupational Health departments at the following commands:

NEPMU-2 Norfolk, VA (804) 444-7671, A/V 564-7671
NEPMU-5 San Diego, CA (619) 556-7070, A/V 526-7070
NEPMU-6 Pearl Harbor, HI (808) 471-9505, A/V 430-9505
NEPMU-7 Naples, Italy (039) 81-724-4468, A/V 625-4468

Navy Environmental Health Center, Norfolk, VA (804)
444-4657, A/V 564-4657

Naval Safety Center, Norfolk, VA

Occupational Health Branch (804) 444-SAFE or
A/V 564-SAFE

Traffic Safety Branch
(804) 444-3344, A/V 564-3344

Training aids for submarine force units are listed in the Submarine On-Board-Training (SOBT) Products catalog. The catalogue is available through COMSUBGRU-2, Code N-24, Naval Submarine Base, New London, CT 06349-5100, commercial (203) 449-3485 or autovon 241-3485. Safety videotapes are distributed by SOBT for permanent retention by submarine force units.

Most tenders and repair ships have safety videotapes available for loan. You are also encouraged to contact your local Red Cross, American Heart Association, American Cancer Society, and American Lung Association for training films.

Videotapes and films make excellent training aids when used as supplements to lectures and presentations. New NAVOSH videotapes are being distributed to all afloat units for permanent retention. Each is accompanied by a NAVOSH Videotape User's Guide. This User's Guide provides a suggested training format, discussion subjects and video presentation highlights. Copies of this User's Guide and NAVOSH videotapes are available from Designers and Planners, Inc. at (703) 418-3800.

<u>TOPIC</u>	<u>TITLE</u>	<u>CATALOG NUMBER</u>
ASBESTOS	* ASBESTOS AT THE WORKSITE	(68164-DN)
	ASBESTOS - DANGER AFLOAT	(82018-DN)
	* SMOKING PREVENTION AND CESSATION	(803504-DN)
ATHLETIC/ HOME	* PHYSICAL FITNESS AND SPORTS	(803506-DN)
	THE FUN OF SAFE BOATING	(46075-DN)
	* IN A FIRE - SECONDS COUNT	(22101-DN)
BACK INJURY	* BACK INJURY PREVENTION	(803503-DN)
BOAT/DECK SAFETY	HOISTING AND LOWERING OF SMALL BOATS	(801717-DN)
	MAN OVERBOARD	(82814-DN)
	MAN OVERBOARD RECOVERY	(25545-DN)
	SYNTHETIC LINE SNAPBACK	(82971-DN)
	SAFE OPERATION OF MATERIAL HANDLING EQUIPMENT	(23523-DN)
	HAZARDS OF THE FLIGHT DECK	(25054-DN)
	SEVEN SAILORS	(24978-DN)
	SHIPBOARD CRUISE SAFETY	(82035-DN)
ELECTRICAL SAFETY	*# ELECTRICAL SAFETY	(805008-DN)
	*# SHIPBOARD TAG-OUT PROCEDURES	(805081-DN)
EYE SAFETY	EASY ON THE EYES	(21730-DN)
	* CAUTION - EYES AT WORK	(21760-DN)
	* STRAIGHT TALK ON EYE SAFETY	(22070-DN)
	EYE SAFETY	(604862-DN)
GAS FREE ENGINEERING	* HAZARDOUS ATMOSPHERE TESTING	(25696-DN)
GENERAL SAFETY	*# NAVOSH - ITS PROTECTING YOU	(804764-DN)
	SAFETY FOR WELDERS	(23661-DN)
	SAFETY SAVES	(21750-DN)
	* A SIMPLE CHOICE	(35142-DN)

* Referred to in the lesson guides

Provided to each ship to retain, accompanied by NAVOSH Videotape User's Guide

GENERAL SAFETY (continued)	YOU AND OFFICE SAFETY	(34750-DN)
	PREVENTING MACHINE INJURIES	(34526-DN)
	PREVENTING CUTS AND STRAINS	(34527-DN)
	* THE COLOR OF DANGER	(22068-DN)
	RIFLE AND PISTOL SAFETY PROCEDURES	(68172-DN)
	* MUST WE FALL? SLIPS, TRIPS AND FALLS	(504320-DN)
	GRINDING WHEEL SAFETY	(21871-DN)
	* LASER SAFETY	(34739-DN)
	* RADIOFREQUENCY RADIATION HEALTH HAZARDS	(803672-DN)
	* DANGER ZONE - YOUR HEAD	(803186-DN)
	VERTICAL PKG CONVEYOR SAFETY	(803783-DN)
HAZARDOUS MATERIALS	*# SHIPBOARD HAZMAT SPILL RESPONSE & CLEAN-UP	(803492-DN)
	*# HAZARDOUS MATERIALS CONTROL AFLOAT	(804939-DN)
	* HANDLING OF HAZARDOUS MATERIALS	(803475-DN)
	* STORAGE OF HAZARDOUS MATERIALS	(803476-DN)
	* DISPOSAL OF HAZARDOUS MATERIALS	(803495-DN)
	* LEAD DUST	(NW446-85-07)
	SHIPBOARD OIL SPILL PROCEDURES	(35009-DN)
HEAT STRESS	* HEAT STRESS MONSTER	(35025-DN)
	* IF YOU CAN'T STAND THE HEAT	(35026-DN)
	* USE AND CARE OF THE WBGT METER	(35335-DN)
HEARING CONSERVATION	HAVE YOU HEARD	(25773-DN)
	HEARING CONSERVATION -FLIGHTDECK/FLIGHTLINE	(43137-DN)
	* HEARING CONSERVATION-SHIPBOARD	(43138-DN)
	HEARING SAFETY	(604863-DN)
RESPIRATORY PROTECTION	*# SHIPBOARD RESPIRATORY PROTECTION FOR THE USER/SUPERVISOR	(805009-DN)
	SAFE BREATHING	(35046-DN)
	RESPIRATORY PROTECTION	(43145-DN)
TRAFFIC SAFETY	DRIVING IN BAD WEATHER	(21728-DN)
	* DEADLIEST WEAPON IN AMERICA	(606348-DN)
	MOTORCYCLE DRIVING TACTICS	(22117-DN)
	EXPERT RIDER	(46017-DN)
	UNDER THE INFLUENCE	(46024-DN)
	TO DRIVE AT NIGHT	(69013-DN)
	WATER SKIING ON FOUR WHEELS	(82868-DN)
	THE PARTY'S OVER	(504343-DN)
	FOOLS RUSH IN	(801736-DN)
	* ROOM TO LIVE	(52568-DN)

* Referred to in the lesson guides

Provided to each ship to retain, accompanied by NAVOSH
Videotape User's Guide

Hazard Awareness Kits (HAWKits) are sound/slide presentations. Many have been converted to videocassette and are available from NETSCLANT/PAC.

HAWKit # 1 - Damage Control (803056-DN)
2 - Deck Seamanship (803057-DN)
3 - Engineering Hazards (803058-DN)
4 - Magazine Sprinkler System (803059-DN)
5 - Shipboard Hazard Items (803060-DN)
6 - General Electrical Safety (803061-DN)
7 - Ship's Boats (5-700024)
#12 - Ground Support Equipment (82211-DN)
#13 - Firewatch (N-63393-79-0005)
#14 - Seat Belt Safety (82213-DN)
#15 - NATOPS Introduction (82214-DN)
#16 - Aircraft Handling Ashore (82215-DN)
#17 - Working Over The Side (N63393-80-0001)
#19 - Submarine-Helo Transfer (82553-DN)
#20 - Driver Improvement (8 modules) (8030113-120)
#21 - Hanger Deck Safety (82554-DN)
#22 - Tool Control (aviation) (801123-DN)
#23 - Submarine Line Handling (N63393-81-0002)
#24 - Ejection Seat Safety (N63993-82-0001)
#25 - Helicopter Dynamic Interface (under development)
#26 - Submarine Damage Control (under revision)
#27 - Safe Motorcycle Operation (800643-DN)
#29 - Safe Bicycle Operation (800827-DN)
#30 - Hazardous Material Labeling (N63393-82-0030)
#32 - Alcohol, Drinking and Driving (800826-DN)
#33 - Submarine Drydock Safety (under revision)
#34 - Submarine Electrical Safety (802364-DN)
#35 - Sammy Seal In Swimming Safety (802578-DN)
#36 - Submarine Firefighting Safety (802361-DN)
#39 - The A-4 OBA (802006-DN)
#40 - Halocarbons (43146-DN)

HAWKITs 8, 9, 10, 11, and 18 contain outdated material. Other films and videocassettes may be deleted from the NETSCLANT/PAC library as they are reviewed for update. Review older films and videocassettes before use to ensure accuracy.

Check OPNAVINST 5100.19B Appendix A7-F for changes to this list. This is only a partial list of available safety training aids. Watch for announcements of new/updated videos provided in the Ships Safety Bulletin and FLASH.

E. FORMAL COURSE LISTING

OPNAVINST 5100.19B, Appendix A7-A lists NAVOSH formal Navy training courses and the required attendees.

<u>COURSE NO.</u>	<u>DURATION</u>	<u>COURSE TITLE</u>	<u>PRESENTED BY</u>
J-8B-0008	2 days	HM/HW Coordinators Course	FTCs
J-9E-0005	3 days	Safety Officer Course	FTCs
B-300-0039	4 days	Hearing Conservation Tech	NEHC
B-322-2301	1 day	Industrial Hygiene Afloat	EPMUs
B-322-2320	1 day	Afloat Hearing/Heat Stress	EPMU 2
B-322-2321	1/2 day	Heat Stress Afloat	EPMUs
B-322-2330	1 day	Health Affects of Asbestos	EPMU 5,6,7
B-322-2331	1/2 day	Asbestos Hazards and Control	EPMU 2,5
B-322-2333	4 days	Analysis of Airborne Asbestos	EPMU 2
B-322-2334	5 days	Identification of Asbestos	EPMU 2
B-322-2340	1 day	Fundamentals of Resp. Prot.	EPMUs
B-322-2350	1 day	Managing Resp. Prot.	EPMU 5,6,7
B-322-2351	1 day	Resp. Prot. Program Mngmnt	EPMU 5
B-322-2360	1/2 day	HAZMAT Info System (HMIS)	EPMUs
B-322-2370	1 day	Occ. Health Surveillance	EPMU 5
J-493-2099	4 days	Safety Petty Officer Course	FTCs
J-651-0469	3 days	Heat/Hearing/Asbestos Hazards	FTC SDGO
K-652-2202	1 day	Heat Stress Orientation	FTC SDGO
K-760-2166	2 days	Asbestos Rip-Out Procedures	FTC SDGO

The Catalog of Navy Training Courses (CANTRAC) provides course convening dates and locations for all of the above courses. Your Educational Services Officer (ESO) should have a copy of the CANTRAC.

Quotas:

Request Fleet Training Center courses through quota control by course location.

Fleet Training Center Norfolk	(804) 444-3499/2424
	A/V 564-3499/2424
Fleet Training Center San Diego	(619) 524-5257
	A/V 524-5257

Request Navy Environmental and Preventive Medicine Units, (NEPMU) courses by message, NAVGRAM, or phone from the appropriate EPMU.

Request Navy Environmental Health Center (NEHC) courses by message, NAVGRAM, or phone.

(804) 444-4657 or A/V 564-4657.

The Naval Safety School offers shore-oriented NAVOSH courses at nearly all major homeports and overseas. The Naval Safety School will be located at Naval Air Station, Bldg SP-17, Norfolk, Virginia in 1991. Information or quotas may be requested by contacting SAFESCOL at autovon 482-1432 or (812) 335-1432.

<u>COURSE NUMBER</u>	<u>DURATION</u>	<u>TOPIC</u>
H-201	8 days	Intro to Industrial Hygiene
H-301	8 days	Advanced Industrial Hygiene
OSHATI-204A	3 days	Machinery/Machine Guarding
OSHATI-222A	4 days	Respiratory Protection Prog. Mngmt
OSHATI-232A	2 days	Workplace Back Injuries
S-101	8 days	Intro to Safety Science
S-152	8 days	Occ. Safety/Gen. Industry Standards
S-251	8 days	Accident Investigation/Reporting
S-253	8 days	Hazard Control Prog. Management
S-354	8 days	Hazardous Material/Waste Control
SG-100	5 days	Improved Safety Performance
SG-150	5 days	Collateral Duty Safety Officer
SG-520	18 days	IHO/Safety Officer Course
SS-310	5 days	Short Course in Ergonomics
ST-300	5 days	Intro to Safety Standards
ST-310	5 days	Electrical Safety Standards
ST-460	8 days	Laser Safety

The Naval Safety Center conducts two workshops. Request quotas by message, NAVGRAM, or phone, (804) 444-1561 or autovon 564-1561. Exportable, on-site workshops are also available upon request from the Naval Safety Center.

2 days	Safety Officer Workshop
2 days	Electrical Safety Officer Workshop

PERSONAL QUALIFICATION STANDARDS- PQS

Afloat Safety Programs Personnel Qualification Standard (PQS), NAVEDTRA 43460-4, NSN 0501-LP-224-3008 was distributed in August 1990. This PQS contains watchstations for Safety Officer; Electrical Safety Officer; Hazardous Material/Hazardous Waste Coordinator; Divisional Safety Petty Officer; Electrical Safety Petty Officer; and Hazardous Material/Hazardous Waste Petty Officer. Currently, only the PQS for Divisional Safety Petty Officer is required by OPNAVINST 5100.19B.

CORRESPONDENCE COURSES

Naval Safety Supervisor, NAVEDTRA 10808-2A, NSN 0502-LP-01-1550, is available as a general overview of afloat and shore safety programs.

F. TECHNICAL ASSISTANCE GUIDE

Training Aids Information -

Naval Education and Training Support Center, Atlantic
Code N5, Bldg W313
Naval Station, Norfolk, VA 23511-6197
Phone (804) 444-4011/1468 or A/V 564-4011/1468

Naval Education and Training Support Center, Pacific
921 West Broadway
San Diego, CA 92132-1360
Phone (619) 532-1360 or A/V 522-1360

Course Information-

Quota Control:

Fleet Training Center Norfolk	(804) 444-3499/2424
	A/V 564-3499/2424
Fleet Training Center San Diego	(619) 524-5257
	A/V 524-5257

Course Information/Quotas:

Naval Safety School, Bloomington, Indiana
(812) 335-9488 or A/V 482-1432

NEPMU-2 Norfolk, VA (804) 444-7671 or A/V 564-7671

NEPMU-5 San Diego, CA (619) 556-7070 or A/V 526-7070

NEPMU-6 Pearl Harbor, HI (808) 471-9505 or A/V 430-9505

NEPMU-7 Naples, Italy (039) 81-724-4468 or A/V 625-4468

Navy Environmental Health Center, Norfolk, VA (804)
444-4657 or A/V 564-4657

Naval Safety Center, Norfolk, VA (804) 444-SAFE or 7634
A/V 564-SAFE or 7634

Naval Safety Center Traffic Safety Course information
(804) 444-3344 or A/V 564-3344

NAVOSH Training Technical Assistance:

Contact the Safety Officer/Industrial Hygiene Officer aboard any of the following tenders or repair ships for training assistance. Frequently, the tender Safety Officer can present the NAVOSH training on board your ship or can provide training aids. SITE TV/CCTV aboard most tenders and repair ships have safety videotapes available for loan.

<u>SHIP</u>	<u>HOMEPORT</u>
USS ACADIA (AD-42)	SAN DIEGO, CA
USS CANOPUS (AS-34)	KINGS BAY, GA
USS CAPE COD (AD-43)	SAN DIEGO, CA
USS DIXON (AS-37)	SAN DIEGO, CA
USS EMORY S. LAND (AS-39)	NORFOLK, VA
USS FRANK CABLE (AS-40)	CHARLESTON, SC
USS FULTON (AS-11)	GROTON/NEW LONDON, CT
USS HOLLAND (AS-32)	CHARLESTON, SC
USS HUNLEY (AS-31)	NORFOLK, VA
USS JASON (AR-8)	SAN DIEGO, CA
USS L. Y. SPEAR (AS-36)	NORFOLK, VA
USS MCKEE (AS-41)	SAN DIEGO, VA
USS ORION (AS-18)	LA MADDALENA, ITALY
USS PRAIRIE (AD-15)	LONG BEACH, VA
USS PROTEUS (AS-19)	GUAM, MI
USS PUGET SOUND (AD-38)	NORFOLK, VA
USS SAMUEL GOMPERS (AD-37)	OAKLAND, CA
USS SHENANDOAH (AD-44)	NORFOLK, VA
USS SIERRA (AD-18)	CHARLESTON, SC
USS SIMON LAKE (AS-33)	HOLY LOCH, SCOTLAND
USS VULCAN (AR-5)	NORFOLK, VA
USS YELLOWSTONE (AD-41)	NORFOLK, VA
USS YOSEMITE (AD-19)	MAYPORT, FL

Assistance on safety training and general safety matters is also available throughout your chain of command. Surface ship groups and squadrons will soon also have full-time primary duty Safety Officers (beginning July 1991).

COMNAVSURFLANT SAFETY (CODE N64)	(804) 444-6669, A/V 564-6669
COMNAVSURFPAC SAFETY (CODE N007)	(619) 437-3137, A/V 577-3137
COMSUBLANT SAFETY (CODE N404)	(804) 444-3046, A/V 564-3046
COMSUBPAC SAFETY (CODE N43)	(808) 474-5585, A/V 430-5585
COMNAVAIRLANT SAFETY (CODE 0187)	(804) 444-7478, A/V 564-7478
COMNAVAIRPAC SAFETY (CODE 80)	(619) 545-2771, A/V 951-2771

G. SAFETY REFERENCE LIST

The lesson guides were prepared using the latest Navy instructions, technical manuals, and publications. The lesson guides refer to the following references:

- * DODINST 6055.11: Protection of DOD Personnel from Exposure to Radiofrequency Radiation
- * OPNAVINST 3120.32B: Standard Organization and Regulations of the U.S. Navy
- * OPNAVINST 5090.1A: Environmental and Natural Resources Protection Manual
- * OPNAVINST 5100.12F: Navy Traffic Safety Program
- * OPNAVINST 5100.19B: Navy Occupational Safety and Health (NAVOSH) Program Manual For Forces Afloat
- * OPNAVINST 5100.20C: Shipboard Heat Stress Control and Personnel Protection
- * OPNAVINST 5100.21A: Naval Surface Ship and Submarine Safety Program
- * OPNAVINST 5100.25A: Recreation, Athletics and Home Safety Program
- * OPNAVINST 5102.1C: Mishap Investigation and Reporting
- * NAVMEDCOMINST 6470.2: Laser Radiation Health Hazards (required reference for ships with a laser safety program)
- * NAVMED P-5010-3: Ventilation and Thermal Stress Ashore and Afloat
- * NAVMED P-5052-5/AFP 160-1/TB MED 507: Prevention, Treatment and Control of Heat Injury
- * NAVMED P-5055: Radiation Health Protection Manual
- * NAVSEA SN000-11-MMO-010: RSS-220 Wet Bulb Globe Temperature Meter (WBGT Meter)
- * SPAWARINST 5100.12A: Navy Laser Hazards Prevention Program (required reference for ships with a laser safety program)

- * ANSI Z87.1-1979: American National Standard - Practice for Occupational and Educational Eye and Face Protection (reference held by tenders and repair ships)
- * Naval Ships' Technical Manual, Chapter 074, Vol 3: Gas Free Engineering
- * Naval Ships' Technical Manual, Chapter 300: Electric Plant General
- * Naval Ships' Technical Manual, Chapter 593: Pollution Control
- * Naval Ships' Technical Manual, Chapter 635: Thermal, Fire and Acoustic Insulation
- * Naval Ships' Technical Manual, Chapter 670: Stowage, Handling, and Disposal of Hazardous General Use Consumables
- * 29 Code of Federal Regulations (CFR) 1910.1025: Lead (required reference for ships with a lead safety program)

You should have most of the applicable references on board, either in your Safety Department, Medical Department or the Engineering Log Room. The instructor should consult the references listed at the beginning of each lesson guide before presenting the training.

OPNAVINST 5100.19B lists additional reference material at the end of each chapter for each NAVOSH topic. Always include your ship's own directives in your training.

H. LESSON GUIDES

These lesson guides, complete with handouts, quizzes and quiz keys, are provided as general guidance. You may adapt, shorten, lengthen, or make them more specific depending on your command's needs.

The instructor of each lesson should consult the listed references before presenting the material. Instructor tasks are designated by capital letters throughout the lesson guides. You may reproduce handouts and quizzes locally and adapt them as desired. In some instances, the instructor is asked to copy a handout from OPNAVINST 5100.19B or some other source. Where applicable, most lessons also list a videotape which you can use to amplify the lecture or provide additional training. However, the lesson guides have been set up for presentation without the videotape, in case it is not available.

COMSUBLANT/COMSUBPACINST C3500.1 discusses monthly training reports which include a Training Requirements Page (TRP). The TRP summarizes the lesson to be presented. A sample TRP is provided for each applicable lesson guide to aid submarine force personnel in meeting NAVOSH training requirements.

The use of short, 10 question quizzes is highly recommended to measure comprehension and instructor effectiveness. Quizzes may also be used as a pre-test, for repeated lessons. Commands are encouraged to prepare more comprehensive examinations, to evaluate their training effectiveness.

Always maintain rosters of personnel who have received training on NAVOSH topics. As safety and occupational health standards and laws become more strict, proof of training will be vital.

Type Commanders have their own training manuals and master training plans. These directives dictate exact training documentation, periodicity and reporting requirements. Check with your command's Training Officer prior to developing your own training documentation system. Have your Training Officer review and approve your NAVOSH lesson guides prior to presentation to ensure they meet command training goals.

: #1

LESSON TOPIC: OCCUPATIONAL SAFETY AND HEALTH PROGRAM

ESTIMATED TIME: 30 Minutes (add 12 minutes for videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

a. OPNAVINST 5100.19B, Section A

TRAINING AIDS:

- a. Videotape: "NAVOSH - It's Protecting You"
(804764-DN)
- b. Copy of OPNAVINST 5100.19B Volumes I and II (surface ships) or III (submarines)
- c. Ship's directives on the NAVOSH program elements
- d. Quiz

OBJECTIVE:

The student should:

a. Be aware, the NAVOSH program exists and the shipboard governing directive is OPNAVINST 5100.19B Volume I and Volumes II (surface ships) or III (submarines).

b. Understand the goals of the NAVOSH program, the chain of command of responsibility, and how NAVOSH derives its safety and health regulations.

c. Understand that the ship has its own directives on safety and health specific to the command which support the NAVOSH program.

TARGET AUDIENCE:

All hands including supervisory personnel.

REQUIREMENT:

Initial training for all personnel in accordance with OPNAVINST 5100.19B.

INTRODUCTION:

As your employer, the Navy is obligated, under law, to provide you with a safe and healthy work environment. Shipboard life is inherently dangerous and, to maintain operational readiness, we must keep our crew members healthy and ready to perform their mission. In 1970, the Occupational Safety and Health Act (OSHA) was adopted, affecting all American workers. The military has adopted most of those same standards, making certain adjustments for military unique situations. The Navy Occupational Safety and Health (NAVOSH) Program has been developed, and is supported by this command, to provide Navy personnel with the safest and healthiest possible working conditions.

A. BACKGROUND

1. The 1970 Occupational Safety and Health Act was directed at the private sector employer, but only vaguely applied to federal agencies.
 - a. Section 19 of the OSHA law, and several subsequent Presidential Executive Orders directed federal agencies to maintain similar occupational safety and health programs.
 - b. Requirements for such programs are contained in 29 Code of Federal Regulations (CFR) Part 1960, with detailed safety and health rules in 29 CFR 1910.
2. Program scope
 - a. A total safety and occupational health program includes all safety programs, such as aviation safety, weapons safety, off-duty safety as well as occupational health programs such as asbestos, hearing conservation and heat stress programs.
 - b. Safety programs must be implemented by all shore, afloat, and aviation commands worldwide. The programs pertain to all military and civilian personnel. Every branch of the Armed Forces has implemented a similar program.
3. Directives
 - a. OPNAVINST 5100.23B- The NAVOSH Program Manual established the Navy's overall safety and health program in 1983, for all naval activities.
 - b. OPNAVINST 5100.19B- NAVOSH Program Manual for Forces Afloat was implemented in April 1989. This manual

takes the afloat unique safety requirements out of the OPNAVINST 5100.23B and serves as the primary resource document for ships and submarines.

INTRODUCE AND SHOW THE VIDEOTAPE "NAVOSH - ITS PROTECTING YOU," IF AVAILABLE.

B. NAVOSH PROGRAM ELEMENTS

1. Occupational health

- a. Occupational health deals with the preservation of the health of workers on the job.
- b. Unlike safety, where the results of a mishap are quickly evident (fall down a ladder), many occupational illnesses and diseases do not show up until years after the worker has been exposed to the hazard. One good example is hearing loss, which is a gradual condition resulting from years of noise exposure.
- c. The Navy is concerned with the occupational health issues, as well as safety, because they affect the quality of life of our sailors, cause lost work time, and cost millions in worker compensation.
- d. The occupational health programs of concern include:

LIST THOSE PERTAINING TO YOUR COMMAND

- (1) Heat stress
- (2) Hearing conservation
- (3) Hazardous materials/hazardous waste
- (4) Sight conservation
- (5) Asbestos exposure control
- (6) Lead safety
- (7) Radiation and laser safety
- (8) Respiratory protection
- (9) Personal protective equipment
- e. These programs are covered by Volume I of the NAVOSH Manual.

2. Occupational safety programs

- a. Occupational safety is concerned with the prevention of mishaps and injuries that may occur on the job.
- b. Most safety mishaps result in immediate injuries or material damage. This affects mission readiness. Anytime a sailor loses a day of work due to a mishap, the command loses a valuable resource and part of the team.
- c. The safety programs under NAVOSH include:
 - (1) Electrical safety
 - (2) Tag-out program
 - (3) Gas-Free Engineering
 - (4) Deck safety (for example, cargo handling, small boats, UNREP, and ground tackle)
 - (5) Weapons safety (general safety precautions)
 - (6) Shipboard aircraft safety (general safety precautions)
 - (7) Machinery and workshop safety
 - (8) Diving operations (general safety precautions)
 - (9) Marine Sanitation Devices (MSD) and Contaminated Holding and Transfer (CHT) safety
 - (10) Hazardous materials handling, storage and disposal

DISCUSS THE ONES PERTAINING TO YOUR COMMAND.

- d. Separate directives give detailed safety requirements for weapons handling, aviation operations and diving safety.

3. The Navy also has off-duty safety programs

a. The off-duty safety programs include:

- (1) Traffic Safety, covered by OPNAVINST 5100.12 (series).
- (2) Recreation, Athletic and Home Safety, covered by OPNAVINST 5100.25 (series).

b. Injuries and deaths resulting from motor vehicle/motorcycle or recreational mishaps are a major cause of lost work days or permanent personnel losses to a command.

c. Often, these safety and health programs overlap. Only by taking all occupational health, on-duty and off-duty safety aspects into account, can we cover the entire spectrum of employment in today's Navy.

C. PROGRAM RESPONSIBILITIES

1. An Assistant Secretary of the Navy is the designated occupational safety and health official for the Department of the Navy and issues policies for both military and civilian personnel.
2. The CNO is responsible for implementing and managing the NAVOSH program.
3. Each fleet commander in chief, type commander, group and squadron commander, right down to our own CO, have a responsibility for implementing the NAVOSH program.
4. Each level of command monitors the effectiveness of the NAVOSH program of their subordinates. INSURV, OPPE, Command Inspections, and many other inspection teams look at the NAVOSH programs.
5. On board our ship, the Safety Officer, working for the CO and XO, is the overall NAVOSH program manager. The Safety Officer, _____, is assisted by the Electrical Safety Officer, Electronic Safety Officer, all Department Heads and Division Officers, and the Medical Department. All work together for an effective shipboard NAVOSH program.
 - a. The Safety Council and Safety Committees meet at least quarterly to discuss the command NAVOSH program, problems and mishaps.

- b. Routine safety and health surveys are conducted throughout the ship. Every work space on board must be safety inspected at least once annually. NAVOSH is also added to zone inspections. At regularly scheduled zone inspections, certain spaces would be designated to receive a "safety zone inspection."
- c. Workplaces are monitored to ensure that all personnel work in a safe and healthy environment.
- d. Training is conducted on all the NAVOSH programs to inform sailors, and ensure their cooperation and support of the program.
- e. All hands are encouraged to report safety and health hazards immediately so they can be corrected. This can be done through internal written hazard reports or verbally to the Safety Officer, or externally to the Naval Safety Center using a SAFETYGRAM.

D. WORKPLACE MONITORING AND MEDICAL SURVEILLANCE

1. Workplace monitoring.

- a. The Safety Officer or Medical Department, with Industrial Hygiene assistance, evaluates or "monitors" the hazards in your work place.
- b. The hazards evaluated or "monitored" include:
 - (1) Ventilation in the space, including any local exhaust and heat problems.
 - (2) Work practices and protective clothing required.
 - (3) Lighting.
 - (4) Overhead obstructions and tripping hazards.
 - (5) Workshop markings and warning signs or labels.
 - (6) Hazardous material storage and handling.
 - (7) Weight handling equipment, such as chain falls.
 - (8) Heat stress conditions.

(9) Electrical safety hazards.

(10) Asbestos hazards.

(11) Exposure to hazardous chemicals, vapors, gases, dusts, mists, or fumes.

(12) Noise hazards.

(13) Eye hazards.

c. The evaluation may include air sampling and testing. An Industrial Hygiene Officer from the tender or shore medical facility does an evaluation. Meters or air pumps with filters would be used, during actual work conditions, to determine your exposure level to a hazard.

d. The evaluation results would determine protective clothing and equipment requirements, the need for more ventilation or redesign of systems, and other changes to make the workplace safer and healthier.

e. Results would also be used to determine if a worker needs medical surveillance.

2. Medical Surveillance

a. Medical surveillance is a method of tracking any changes in the health of workers who are exposed to potential health hazards.

(1) A good example of medical surveillance is the hearing tests given every year to personnel working in noise hazardous areas. We monitor them to see if a hearing loss is occurring or getting worse.

(2) Even exposures to hazards off-duty are of concern to the Navy. For example, one sailor made lead fishing weights at home as a hobby. He melted the lead on his kitchen stove and inhaled the lead fumes. Knowing about this hobby was important during a physical exam when he showed symptoms of lead poisoning.

b. Medical surveillance may be required of personnel assigned to spill teams, rip-out teams, or to a hazardous working condition where exposure may still occur.

- (1) Pre-placement physical exams are done to ensure there is no pre-existing condition which could be made worse by the exposure.
- (2) Periodic physical exams are done to follow-up workers' health for trends.
- (3) Termination (after completion of the job, billet, or upon separation/retirement) exams are done to document health affects.
- (4) Documenting exposure to hazards during active duty is necessary to prove it is occupationally-related, should symptoms arise after separation or retirement.
- (5) When asked by the Medical Department to complete a surveillance questionnaire or report for a physical, cooperate and report or time. These exams are to protect your health.

DISCUSS ANY MEDICAL SURVEILLANCE PROGRAMS GOING ON CURRENTLY AT YOUR COMMAND. GIVE EXAMPLES OF THE TYPES AND FREQUENCY OF PHYSICAL EXAMINATIONS.

SUMMARY:

The Navy Occupational Safety and Health Program (NAVOSH) has been implemented to protect civilian and military workers. We must do our best to keep all our trained, productive crew members safe and healthy, and ready to perform their assigned tasks. As a responsible employer, the Navy is obligated to provide you with the safest and healthiest work environment possible. On older ships, this can be quite a challenge. This command fully supports the NAVOSH program.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.19B VOLUMES I AND II (surface ships) or III (submarines).

ADMINISTER 10 QUESTION QUIZ INCLUDED WITH THIS LESSON. REPRODUCE LOCALLY. QUIZ ANSWER KEY IS PROVIDED.

OCCUPATIONAL SAFETY AND HEALTH QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. The NAVOSH program does not include any safety programs.

- A. True
- B. False

2. All workcenters should have which directive handy for general safety standards?

- A. OPNAVINST 5100.23B
- B. OPNAVINST 5100.19B Volume II or III
- C. NSTM, Chapter 670
- D. OSHA regulations
- E. OPNAVINST 5100.19A

3. The asbestos program and hearing conservation programs are classified as:

- A. Occupational health programs
- B. Occupational safety programs
- C. Programs for ships only
- D. Programs not applicable to aviation
- E. Engineering programs

4. The military has adopted every OSHA regulation word for word.

- A. True
- B. False

5. The Ship's Safety Officer manages all the NAVOSH programs onboard.

- A. True
- B. False

6. Workplace monitoring determines if you are being exposed to health hazards as you work.

- A. True
- B. False

7. The audiograms or hearing tests given annually to engineering personnel are classified as a:

- A. Workplace program
- B. Noise evaluation program
- C. Medical surveillance program
- D. Medical data program
- E. None of the above

8. To determine if you need to wear a respirator, you should:

- A. Ask the chief
- B. See if anyone else is using one
- C. Check with other ships of that class
- D. Ask Medical or Safety to evaluate the hazard
- E. Have the LPO check the ventilation

9. The most lost work time and permanent loss due to injury mishaps each year occur:

- A. On-duty
- B. Underway
- C. On the ship while moored
- D. At shore commands
- E. Off-duty from recreation and driving

10. Each work space must have a safety inspection at least:

- A. Every 5 years
- B. Before each INSURV
- C. Annually
- D. Quarterly
- E. Monthly

OCCUPATIONAL SAFETY AND HEALTH QUIZ KEY:

1. B
2. B
3. A
4. B
5. A
6. A
7. C
8. D
9. E
10. C

#2

SSON TOPIC: HEAT STRESS PROGRAM (Non-Supervisory)

ERAGE TIME: 30 minutes (add 18 minutes for videotape)

STRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.20C
- b. NAVMED P-5010-3 (REV. 1988)
- c. OPNAVINST 5100.19B, Chapter B2
- d. NAVMED P-5052-5/AFP 160-1/TB MED 507

TRAINING AIDS:

- a. Videotape: "Heat Stress Monster" (35025-DN)
- b. Dry Bulb Thermometer (9G 6685-00-243-9964)
- c. Handout #1- Heat Stress First Aid
- d. WBGT Meter (Reuter-Stokes RSS-220)
- e. Quiz

JECTIVES:

The student should be able to identify the causes of heat stress, understand the symptoms of heat strain and the first aid for heat-related illnesses, be familiar with the terms WBGT, Physiological Heat Exposure Limit (PHEL) and why we monitor hot areas, and know when to notify their supervisors of potential heat stress conditions.

ARGET AUDIENCE:

All hands (non-supervisory) who work in potential heat stress areas or who may be affected by heat stress conditions. This lesson is a recommended prerequisite for heat stress monitoring certification.

QUIREMENT:

Initial and annual all-hands training for personnel with potential high heat exposure, in accordance with OPNAVINST 00.20C

INTRODUCTION:

The Navy is concerned with heat stress because, ship's engineering spaces, galleys, sculleries and laundries historically have been plagued with high heat and humidity problems. Since the days of coal-fired ships, sailors have dealt with the stress of hot, poorly ventilated, confined spaces in steel hulls. Heat stress directly affects our readiness, since the results of heat stress cause us to lose watchstanders to heat illnesses, degrading performance and crew morale.

A. PHYSIOLOGY OF HEAT STRESS

1. Heat stress is the effect of the following factors on the human body as it tries to regulate body temperature.
 - a. As the body works, it generates internal heat. External factors, such as air temperature, humidity, and radiant heat also affect the body's internal temperature.
 - b. The body tries to regulate it's internal temperature naturally through perspiration, which evaporates to cool the body. Blood brings the inner core heat to the skin's surface (flushing) to dissipate heat.
 - c. When the body's natural cooling ability fails, heat builds up and stresses the body. This heat stress can lead to serious heat illness.
 - d. The types of heat which affect the body are:
 - (1) Air temperature, which is measured by the dry bulb thermometer.

SHOW STUDENTS DRY BULB THERMOMETER

- (2) Thermal radiation is heat radiating from hot surfaces. Sunshine and hot metal give off radiant heat. It is measured with a black globe containing a thermometer.
- (3) Humidity, the amount of moisture in air, is measured with a wet bulb thermometer or a thermometer covered by a wetted sock.
- (4) Air flow, or the ventilation in the space, supply air and exhaust removing heated air, used to cool and evaporate perspiration.

2. Heat stress could produce symptoms such as:
 - a. Fatigue
 - b. Severe headaches
 - c. Nausea
 - d. Decreased performance - physical and mental
3. Wearing chemical protective clothing, Fire Fighting Ensembles (FFE) or Proximity Suits could also cause heat stress illness, even though the wearer is not in a heat stress area.
4. High humidity, combined with heavy exercise, even at relatively cool temperatures, can lead to heat casualties as well.
5. Illness, intoxication, and poor physical condition also affect how the body responds to heat stress, and may significantly decrease your normal tolerance to heat.

INTRODUCE AND SHOW "HEAT STRESS MONSTER" VIDEOTAPE.

B. NAVY HEAT STRESS CONTROL PROGRAM

1. Heat stress problems are critical on some ships.

GIVE EXAMPLES OF FIREROOMS ON SHIPS IN GITMO OR PERSIAN GULF AS 140 DEGREES, WITH SUPPLY AIR TEMPERATURES OF 105 DEGREES!
2. CNO has set policy in OPNAVINST 5100.20 (series).
3. NAVSEA and TYCOMs try to reduce heat stress problems by designing better ventilation, providing funds for engineering controls, and assisting in repairs.
4. INSURV and the OPPE board inspect the heat stress program.
5. Each Commanding Officer is responsible for:
 - a. Reducing heat stress problems on board through PMS, and repairing steam leaks and ventilation problems.
 - b. Ensuring heat stress problem areas are monitored.
 - c. Assigning personnel to monitor heat stress, and maintaining records of heat stress readings.

- d. Conducting a JAG investigation of any heat stress incident where the victim became unconscious.
- 6. The Engineering Officer, Supply Officer, and Medical Department Representative all have specific duties to perform.
- 7. The objective of the program is to prevent heat stress casualties and maintain readiness.

STUDENT QUESTION: WHERE ARE SOME OF THE AREAS ON BOARD THIS SHIP WITH HIGH HEAT OR HUMIDITY PROBLEMS? WHEN ARE THE CONDITIONS AT THEIR WORST?

C. HEAT STRESS PROGRAM PARAMETERS

- 1. Identify the problem areas.
 - a. Determine which manned areas have the potential for heat stress.
 - b. Include areas on weather decks and flight decks.
- 2. Eliminate heat stress problems, if possible.
 - a. Engineering controls can be used if feasible, such as better ventilation, more insulation on hot piping, fixing steam leaks, adding air conditioning, or insulating bulkheads and overheads which get summer sun.
 - b. SHIPALT funding is available to correct heat stress problems. Document discrepancies on a 4790/2K for inclusion in the CSMP.
- 3. Monitor heat stress areas.
 - a. Hang dry bulb thermometers to monitor personnel exposures to heat.
 - b. Record temperature readings once per watch or work session.
- 4. Conduct WBGT Heat Stress Meter surveys.
 - a. Contact Engineering Department heat stress monitor or Medical Department Representative (non-engineering areas) for detailed heat stress readings:
 - (1) If the dry bulb temperature exceeds 100 degrees Fahrenheit

- (2) Prior to casualty control drills
- (3) During conditions of high heat or humidity
- (4) During post casualty restoration
- (5) During arduous, heavy work in hot areas
- (6) When deemed necessary by CO, OOD, EOOW, or CHENG
- (7) Before the end of the determined stay-time (if the stay-time is less than a routine watch/work session), or at hottest part of day (if the stay-time is greater than a routine watch/work session).

NOTE: THESE CRITERIA MAY CHANGE WITH THE PROMULGATION OF THE UPDATED OPNAVINST 5100.20D.

- b. All steam ships have at least two WBGT meters.
- c. WBGT meter readings are taken only by QUALIFIED heat stress monitors. The results are given the EOOW or cognizant department head, Chief Engineer, OOD, CDO, XO and CO.
- d. The WBGT meter results are used, with a Physiological Heat Exposure Limit (PHEL) chart, to determine stay-times in hours and minutes.
 - (1) The PHEL chart is set-up into 6 different curves, I through VI (Roman numerals), corresponding to different levels of activity. I = light work and VI = heavy work.
 - (2) OPNAVINST 5100.20 (series) gives a recommended chart curve for certain watches or areas, such as the scullery.

SHOW STUDENTS THE PHEL CHART IN OPNAVINST 5100.20C

- (4) At the end of the stay-time, supervisors will rotate exposed people to give them time to recover.
- (5) Recovery time out of the hot area is determined by doubling the stay-time (up to the maximum of four hours).
- (6) Recovery time must be spent in a cooler area, resting, with drinking water available.

D. PERSONNEL WORKING IN HEAT STRESS AREAS:

DISTRIBUTE HANDOUT #1-HEAT STRESS FIRST AID.

1. Everyone should know heat stress symptoms and first aid.

a. Heat Exhaustion

(1) Symptoms

- (a) Skin pale and clammy, profuse sweating
- (b) Pulse fast and weak, breathing fast/shallow
- (c) Dizziness, nausea

(2) First Aid

- (a) If unconscious, CALL A MEDICAL EMERGENCY.
- (b) Loosen clothing
- (c) Move to cooler space
- (d) If feeling faint, lower head to knees
- (e) Give sips of water
- (f) Take to Medical

b. Heat Stroke

(1) Symptoms

- (a) Skin hot, flushed and dry
- (b) Pulse fast and strong, breathing deep
- (c) Vomiting, cramps, twitching
- (d) Will go into shock- can be FATAL!

(2) First Aid:

- (a) CALL A MEDICAL EMERGENCY IMMEDIATELY!
- (b) Move to cool space,
- (c) Remove clothing

- (d) Cover with cold, wet material
 - (e) Gently massage legs and arms.
 - (f) Lower body temperature to 101 degrees F and maintain until natural temperature regulation restored - brain damage or death can occur without treatment.
2. If working in a hot area where a dry bulb thermometer is mounted to monitor the temperature, contact your supervisor if the temperature goes above 100 degrees.
 3. Keep an eye on your shipmates and watch for heat stress illness symptoms. Know your own limitations.
 4. To prevent or minimize heat stress:
 - a. Eat well
 - b. Drink water frequently
 - c. Get plenty of rest
 - d. Allow your body to acclimatize to the heat before undertaking vigorous activity. WATER IS THE BEST FLUID - COFFEE, SODAS AND GATORADE DO NOT REPLENISH YOUR FLUID LEVELS AS EFFICIENTLY. Do not take salt tablets- you get enough salt eating regular meals.
 5. Take your required recovery time when leaving a heat stress area. Recovery time is calculated as twice the stay-time, up to 4 hours. For example, if your stay-time is one hour, your recovery time in a cool space is two hours. For a stay-time of three hours, your recovery time is four hours (the maximum).
 6. Report heat stress related problems to your supervisor. They include missing lagging, steam leaks, inoperable or inadequate ventilation, or excessive water in the bilges.

SUMMARY:

The Heat Stress Program was developed to protect personnel working in hot areas. We monitor the temperature and have equipment to monitor the three types of heat affecting your body. While healthy individuals are able to handle working in hot areas, at a certain point, the stress heat places on your body may cause heat stress illness. Personnel working in these areas must understand the potential for heat stress, that the Navy has Heat Stress Program, and what to do if a shipmate experiences heat stress illness.

FOR MORE INFORMATION, CONSULT OPNAVINST 5100.20C, OPNAVINST 5100.19B OR TALK TO THE MEDICAL DEPARTMENT REPRESENTATIVE.

ADMINISTER 10 QUESTION QUIZ ON THIS HEAT STRESS LESSON. QUIZ AND KEY PROVIDED. REPRODUCE LOCALLY.

HEAT STRESS FIRST AID

HEAT EXHAUSTION

- *SKIN PALE, CLAMMY, PROFUSE SWEATING
 - *PULSE FAST AND WEAK
 - *BREATHING FAST AND SHALLOW
 - *MILD CRAMPS, WEAKNESS, NAUSEA
 - *DIZZINESS
-

1. LOOSEN CLOTHING
 2. IF ABOUT TO FAINT, SIT VICTIM DOWN AND PLACE HEAD LOWER THAN KNEES
 3. MOVE TO COOLER SPACE
 4. GIVE SIPS COLD WATER DRINK HALF GLASS WATER EVERY 15 MINUTES
 5. GET VICTIM TO MEDICAL AS SOON AS POSSIBLE. IF UNCONSCIOUS, CALL MEDICAL EMERGENCY. DO NOT MOVE VICTIM IN CASE OF OTHER INJURIES
-

HEAT STROKE

- *SKIN HOT, FLUSHED, DRY
 - *PULSE FAST AND STRONG
 - *BREATHING FAST AND DEEP
 - *TWITCHING, VOMITING
 - *SHOCK WILL FOLLOW
CAN BE FATAL!
-

1. CALL A MEDICAL EMERGENCY AT ONCE!
 2. GET VICTIM TO SICK BAY OR NEAREST COOL SPACE UNTIL TRANSFER
 3. UNDRESS. COVER WITH WET, COLD CLOTHS OR SPONGE OFF
 4. MASSAGE BODY TO RESTORE CIRCULATION
 5. TAKE BODY TEMP EVERY 10 MINUTES. DO NOT ALLOW TEMP TO GO BELOW 101 DEGREES
-

REMEMBER: HEAT STROKE IS A LIFE-THREATENING MEDICAL EMERGENCY. ANY CASE WHERE THE VICTIM BECOMES UNCONSCIOUS MUST BE REPORTED TO THE COMMANDING OFFICER IMMEDIATELY AND A JAG INVESTIGATION CONDUCTED (UNLESS DEEMED OTHERWISE BY ISIC).

MEDICAL IS REQUIRED TO COMPLETE A REPORT OF HEAT CASUALTY FOR EVERY HEAT STRESS INJURY, SO WE CAN TRACK THE EFFECTIVENESS OF THE PROGRAM.

HEAT STRESS PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. Thermometers placed high in the overhead of a hot space do not give an accurate reading of worker heat exposure.

- A. True
- B. False

2. The only time you need to record space temperatures is in the summer time.

- A. True
- B. False

3. The most serious heat illness and a medical emergency is:

- A. Heat cramps.
- B. Heat exhaustion.
- C. Heat stroke.
- D. Heat rash.

4. The radiant heat in a fireroom comes from:

- A. Hot air from the blowers.
- B. Water in the bilges.
- C. Hot metal surfaces.
- D. Lack of ventilation.

5. Your heat stress recovery time can be spent in the hot space if you stop working.

- A. True
- B. False

6. The meter used to determine stay times is called the:

- A. Heat radiation meter.
- B. Total temperature meter.
- C. Humidity meter.
- D. Wet bulb globe temperature meter (WBGT).

7. You should take plenty of salt tablets when you work in a hot space.

- A. True
- B. False

8. Heat stress may affect you even more if you are suffering from a hangover or bad cold.

- A. True
- B. False

9. The Navy has a heat stress program to help maintain mission readiness.

- A. True
- B. False

10. You need to call the heat stress monitor for meter readings when:

- A. The thermometer reads 90 degrees.
- B. When the temperature is over 100 degrees.
- C. When the ventilation is turned off.
- D. When the ship begins a full-power run.

HEAT STRESS QUIZ KEY:

1. A
2. B
3. C
4. C
5. B
6. D
7. B
8. A
9. A
10. B

LG #3

LESSON TOPIC: HEAT STRESS PROGRAM (Supervisory)

AVERAGE TIME: 30 Minutes (add 14 minutes for videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.20C
- b. NAVMED P-5010-3 (REV. 1988)
- c. OPNAVINST 5100.19B, Chapter B2
- d. NAVMED P-5052-5/AFP 160-1/TB MED 507

TRAINING AIDS

- a. Videotape: "If You Can't Stand The Heat" (35026-DN)
- b. Dry Bulb Thermometer (9G 6685-00-243-9964)
- c. Handout #1 - PHEL Chart
- d. Handout #2 - Heat Stress First Aid
- e. WBGT Meter (Reuter-Stokes RSS-220)
- f. Quiz

OBJECTIVES:

The student should be able to identify the causes of heat stress, understand the symptoms of heat strain, and as a supervisor, know the first aid for heat illnesses among their personnel. Also, be familiar with the terms WBGT, how to use a Physiological Heat Exposure Limit (PHEL) reading to determine stay-times for their personnel, understand how to calculate recovery times, and interpret reports required.

TARGET AUDIENCE:

Supervisory personnel, Officers and CPOs, Leading Petty Officers and engineering department EOOWs, BTOWs and ECCTT and DCTT personnel.

REQUIREMENT:

Initial and annual training for applicable supervisory personnel in accordance with OPNAVINST 5100.20C.

INTRODUCTION:

The Navy is concerned with heat stress because, ship's engineering spaces, galleys, sculleries and laundries historically have been plagued with high heat and humidity problems. Since the days of coal-fired ships, sailors have dealt with the stress of hot, poorly ventilated, confined spaces in steel hulls. Heat stress directly affects our readiness, since the results of heat stress cause us to lose watchstanders to heat illnesses, degrading performance and crew morale.

A. PHYSIOLOGY OF HEAT STRESS

1. Heat stress is the effect of the following factors on the human body as it tries to regulate body temperature.
 - a. As the body works, it generates internal heat. External factors, such as air temperature, humidity, and radiant heat also affect the body's internal temperature.
 - b. The body tries to regulate it's internal temperature naturally through perspiration, which evaporates to cool the body. Blood brings the inner core heat to the skin's surface (flushing) to dissipate heat.
 - c. When the body's natural cooling ability fails, heat builds up and stresses the body. This heat stress can lead to serious heat illness.
 - d. The types of heat which affect the body are:
 - (1) Air temperature, which is measured by the dry bulb thermometer.

SHOW STUDENTS DRY BULB THERMOMETER

- (2) Thermal radiation is heat radiating from hot surfaces. Sunshine and hot metal give off radiant heat. It is measured with a black globe containing a thermometer.
- (3) Humidity, the amount of moisture in air, is measured with a wet bulb thermometer or a thermometer covered by a wetted sock.
- (4) Air flow, or the ventilation in the space, supply air and exhaust removing heated air, used to cool and evaporate perspiration.

2. Heat stress could produce symptoms such as:
 - a. Fatigue
 - b. Severe headaches
 - c. Nausea
 - d. Decreased performance - physical and mental
3. Wearing chemical protective clothing, Fire Fighting Ensembles (FFE) or Proximity Suits could also cause heat stress illness, even though the wearer is not in a heat stress area.
4. High humidity, combined with heavy exercise, even at relatively cool temperatures, can lead to heat casualties as well.
5. Illness, intoxication, and poor physical condition also affect how the body responds to heat stress, and may significantly decrease your normal tolerance to heat.

INTRODUCE AND SHOW "IF YOU CAN'T STAND THE HEAT" MOVIE.

B. NAVY HEAT STRESS CONTROL PROGRAM

1. Heat stress problems are critical on some ships.

GIVE EXAMPLES OF FIREROOMS ON SHIPS IN GITMO OR PERSIAN GULF AS 140 DEGREES, WITH SUPPLY AIR TEMPERATURES OF 105 DEGREES!
2. CNO has set policy in OPNAVINST 5100.20 (series).
3. NAVSEA and TYCOMs try to reduce heat stress problems by designing better ventilation, providing funds for engineering controls, and assisting in repairs.
4. INSURV and the OPPE board inspect the heat stress program.
5. Each Commanding Officer is responsible for:
 - a. Reducing heat stress problems on board by good PMS, repairing steam leaks and ventilation problems.
 - b. Ensuring heat stress problem areas are monitored.
 - c. Assigning personnel to monitor heat stress, and maintaining records of heat stress readings.

- d. Conducting a JAG investigation of any heat stress incident where the victim became unconscious.
- 6. The Engineering Officer, Supply Officer, and Medical Department Representative all have specific duties to perform.
- 7. The objective of the program is to prevent heat stress casualties and maintain readiness.

STUDENT QUESTION: WHERE ARE SOME OF THE AREAS ON BOARD THIS SHIP WITH HIGH HEAT OR HUMIDITY PROBLEMS? WHEN ARE THESE CONDITIONS THEIR WORST?

C. HEAT STRESS PROGRAM PARAMETERS

- 1. Identify the problem areas.
 - a. Determine which manned areas have the potential for heat stress.
 - b. Include areas on weather decks and flight decks.
- 2. Eliminate heat stress problems, if possible.
 - a. Engineering controls can be used if feasible, such as better ventilation, more insulation on hot piping, fixing steam leaks, adding air conditioning, or insulating bulkheads and overheads which get summer sun.
 - b. SHIPALT funding is available to correct heat stress problems. Document discrepancies on a 4790/2K for inclusion in the CSMP.
- 3. Monitor heat stress areas.
 - a. Hang dry bulb thermometers to monitor personnel exposures to heat.
 - b. Record temperature readings once per watch or work session.
- 4. Conduct WBGT Heat Stress Meter surveys.
 - a. Contact Engineering Department heat stress monitor or Medical Department Representative (non-engineering areas) for detailed heat stress readings:
 - (1) If the dry bulb temperature exceeds 100 degrees Fahrenheit

- (2) Prior to casualty control drills
- (3) During conditions of high heat or humidity
- (4) During post casualty restoration
- (5) During arduous, heavy work in hot areas
- (6) When deemed necessary by CO, OOD, EOOW, or CHENG
- (7) Before the end of the determined stay-time (if the stay-time is less than a routine watch/work session), or at hottest part of day (if the stay-time is greater than a routine watch/work session).

NOTE: THESE CRITERIA MAY CHANGE WITH THE PROMULGATION OF THE UPDATED TO OPNAVINST 5100.20.

- b. All steam ships have at least two WBGT meters.
- c. WBGT meter readings are taken only by QUALIFIED heat stress monitors. The results are given the EOOW or cognizant department head, Chief Engineer, OOD, CDO, XO and CO.
- d. The WBGT meter results are used, with a Physiological Heat Exposure Limit (PHEL) chart, to determine stay-times in hours and minutes.

D. USING PHYSIOLOGICAL HEAT EXPOSURE LIMIT (PHEL) OR STAY-TIME INFORMATION

1. Stay-times in a hot area are determined by taking WBGT meter readings, which give a WBGT Index, and finding that index on a Physiological Heat Exposure Limit (PHEL) chart. Stay-times are given in hours and minutes.
 - a. PHEL chart set-up into 6 different curves, I through VI in Roman numerals.
 - b. The chart Roman numerals correspond to different level of activity. For example, I = least activity and VI = heavy work.
 - c. OPNAVINST 5100.20C has a recommended chart curve for certain watches or areas, such as the scullery.

SEE HANDOUT #1 - PHEL CHART.

- d. Supervisors know best which level of work corresponds, and may adjust accordingly.

EXAMPLE: USING THE PHEL CHART, YOUR LAUNDRY PERSONNEL ARE ENGAGED IN CHECKING-IN LAUNDRY AND NO EQUIPMENT IS CURRENTLY ON-LINE. YOU COULD USE THE PHEL CURVE I OR II, REPEATING THE SURVEY WHEN THEIR LEVEL OF WORK CHANGES.

- e. Supervisors must rotate personnel to ensure stay-times are enforced and personnel are given adequate recovery time.

- (1) Recovery time out of the hot area is determined by doubling the stay-time (up to the maximum of four hours).

- (2) Recovery time must be spent in a cooler area, resting, with drinking water available.

- f. Supervisors must notify their Department Head of problems enforcing stay-times. For example, too few personnel to rotate the watch or no stand-by watchstanders.

- g. Supervisors must be aware of how the heat is affecting their personnel.

- (1) Personnel who are tired, drank alcohol within the last 24 hours, are sick or hungry may be affected quicker by lower temperatures.

- (2) Be aware of the "macho" individuals who think they can take the heat.

- (3) Be aware of new personnel who are not acclimatized to the hot area.

- (4) Stack gases or fuel vapors may also impact on stay-times. Supervisors should look for the following symptoms:

- (a) Eyes watering

- (b) Difficulty breathing

- (c) Tingling or numbness of extremities

- (d) Sensation of intoxication

- (5) If stack gases are affecting personnel, the reduce stay-times to 66% (about two-thirds) the calculated value. For example, if the calculated stay-time is 30 minutes, the presence of stack gases would reduce the stay-time to 10 minutes.

DISTRIBUTE AND DISCUSS HANDOUT #2 - HEAT STRESS FIRST AID

- h. Supervisors should encourage their personnel to drink water and ensure water is available in hot areas. Personnel should not use salt tablets.
- j. Adequate rest and regular meals help personnel cope with heat stress. Personnel with colds or hangovers may be affected by heat stress more quickly.
- j. Supervisors in identified heat stress areas should also ensure their personnel are trained in heat stress first aid.

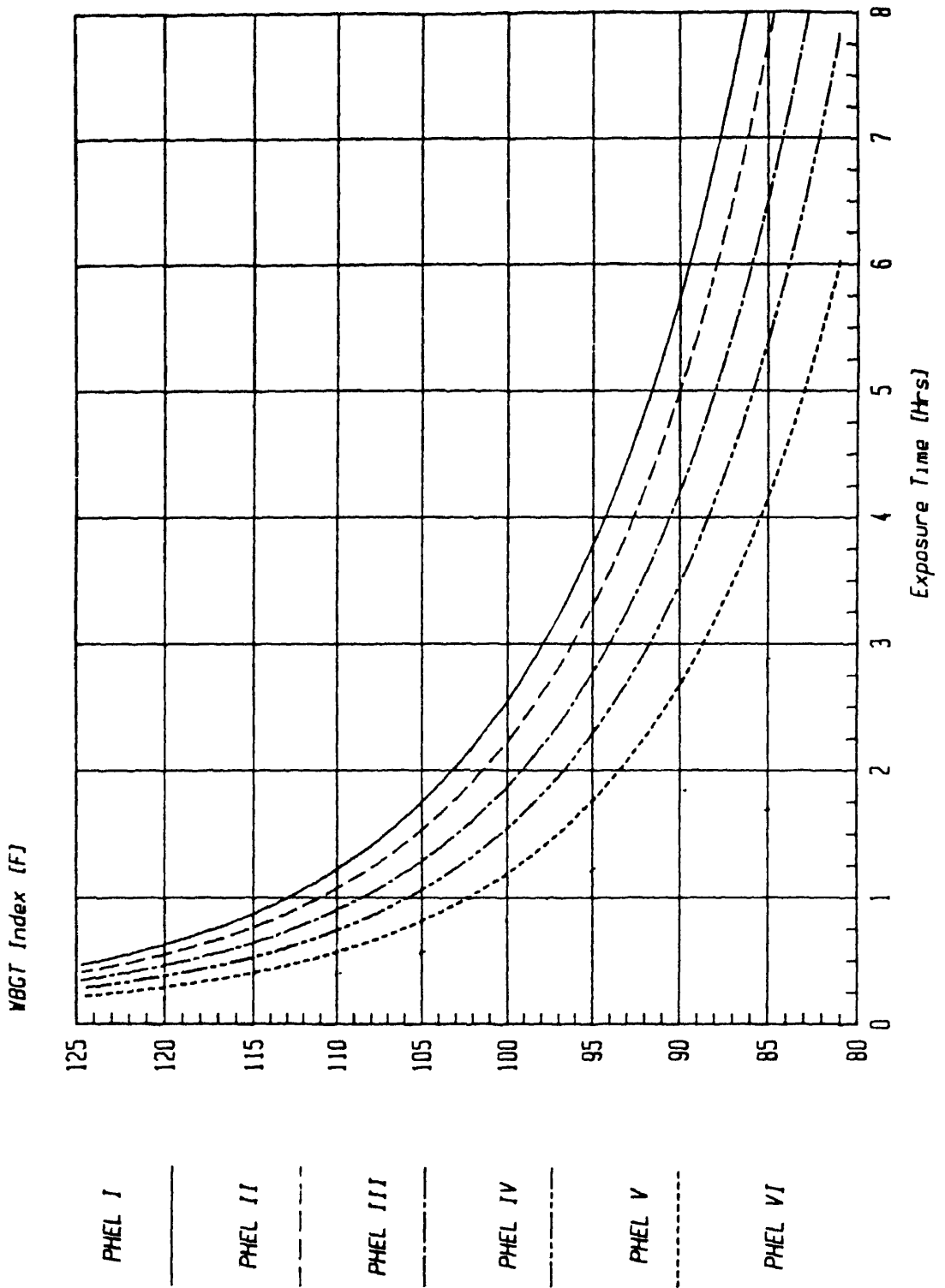
SUMMARY:

Good supervision is a critical aspect of the heat stress program. Knowing which areas under their cognizance are potential heat stress areas, monitoring the areas, and preventing their personnel from heat illnesses is a supervisory function. Only the supervisor observing the working conditions can make a judgement on stay-times and PHEL curve applicability, and enforce recovery times.

FOR MORE INFORMATION, CONSULT OPNAVINST 5100.20C OR TALK TO YOUR MEDICAL DEPARTMENT REPRESENTATIVE.

OPTIONAL 10 QUESTION QUIZ AND KEY AVAILABLE AT THE END OF THIS LESSON GUIDE. REPRODUCE LOCALLY.

PHEL CHART [Curves I - VI]



HEAT STRESS FIRST AID

HEAT EXHAUSTION

*SKIN PALE, CLAMMY, PROFUSE SWEATING
*PULSE FAST AND WEAK
*BREATHING FAST AND SHALLOW
*MILD CRAMPS, WEAKNESS, NAUSEA
*DIZZINESS

1. LOOSEN CLOTHING
 2. IF ABOUT TO FAINT, SIT
VICTIM DOWN AND PLACE HEAD
LOWER THAN KNEES
 3. MOVE TO COOLER SPACE
 4. GIVE SIPS COLD WATER
DRINK HALF GLASS WATER EVERY
15 MINUTES
 5. GET VICTIM TO MEDICAL
AS SOON AS POSSIBLE. IF
UNCONSCIOUS, CALL MEDICAL
EMERGENCY. DO NOT MOVE
VICTIM IN CASE OF OTHER
INJURIES
-

HEAT STROKE

*SKIN HOT, FLUSHED, DRY
*PULSE FAST AND STRONG
*BREATHING FAST AND DEEP
*TWITCHING, VOMITING
*SHOCK WILL FOLLOW
CAN BE FATAL!

1. CALL A MEDICAL
EMERGENCY AT ONCE!
 2. GET VICTIM TO SICK
BAY OR NEAREST
COOL SPACE UNTIL
TRANSFER
 3. UNDRESS. COVER WITH
WET, COLD CLOTHS OR
SPONGE OFF
 4. MASSAGE BODY TO
RESTORE CIRCULATION
 5. TAKE BODY TEMP EVERY
10 MINUTES. DO NOT
ALLOW TEMP TO GO
BELOW 101 DEGREES
-

REMEMBER: HEAT STROKE IS A LIFE-THREATENING MEDICAL EMERGENCY.
ANY CASE WHERE THE VICTIM BECOMES UNCONSCIOUS MUST BE REPORTED TO
THE COMMANDING OFFICER IMMEDIATELY AND A JAG INVESTIGATION
CONDUCTED (UNLESS DEEMED OTHERWISE BY ISIC).

MEDICAL IS REQUIRED TO COMPLETE A REPORT OF HEAT CASUALTY FOR
EVERY HEAT STRESS INJURY, SO WE CAN TRACK THE EFFECTIVENESS OF
THE PROGRAM.

HEAT STRESS PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. Thermometers placed high in the overhead of a hot space do not give an accurate reading of worker heat exposure.
 - A. True
 - B. False
2. The only time you need to record space temperatures is in the summer time.
 - A. True
 - B. False
3. The most serious heat illness and a medical emergency is:
 - A. Heat cramps.
 - B. Heat exhaustion.
 - C. Heat stroke.
 - D. Heat rash.
4. The radiant heat in a fireroom comes from:
 - A. Hot air from the blowers.
 - B. Water in the bilges.
 - C. Hot metal surfaces.
 - D. Lack of ventilation.
5. Your heat stress recovery time can be spent in the hot space if you stop working.
 - A. True
 - B. False
6. The meter used to determine stay times is called the:
 - A. Heat radiation meter.
 - B. Total temperature meter.
 - C. Humidity meter.
 - D. Wet bulb globe temperature meter (WBGT).

7. You should take plenty of salt tablets when you work in a hot space.

- A. True
- B. False

8. Heat stress may affect you even more if you are suffering from a hangover or bad cold.

- A. True
- B. False

9. The Navy has a heat stress program to help maintain mission readiness.

- A. True
- B. False

10. You need to call the heat stress monitor for meter readings when:

- A. The thermometer reads 90 degrees.
- B. When the temperature is over 100 degrees.
- C. When the ventilation is turned off.
- D. When the ship begins a full-power run.

HEAT STRESS QUIZ KEY:

1. A
2. B
3. C
4. C
5. B
6. D
7. B
8. A
9. A
10. B

LG #4

LESSON PLAN: HEAT STRESS MONITORING AND USE OF THE WBGT METER

AVERAGE TIME: 45 Minutes (add 18 minutes for videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.20C
- b. NAVSEA SN000-11-MMO-010:RSS-220 WBGT METER
- c. NAVMED P-5010-3
- d. OPNAVINST 5100.19B, Chapter B2

TRAINING AIDS:

- a. Videotape: "Use and Care of the WBGT Meter" (35335-DN)
- b. Copy of ship's Heat Stress Program directive
- c. WBGT Meter (Reuter-Stokes RSS-220)
- d. Handout #1- WBGT Meter Monitoring Situations
- e. Handout #2- Your ship's WBGT Monitoring Form
- f. Handout #3- PHEL Chart
- g. Handout #4- PHEL Curve General Applicability Table
- h. Handout #5- Monitor Exercise
- i. Quiz

OBJECTIVES:

The student should be able to identify the parts and functions of the WBGT meter, demonstrate how the meter is used to conduct heat stress surveys, be able to use a Physiological Heat Exposure Limit (PHEL) chart, and be familiar with monitor reporting requirements.

TARGET AUDIENCE:

Personnel in the Engineering and Medical Departments designated heat stress monitors.

REQUIREMENT:

Initial and annual refresher training for designated heat stress monitors, in accordance with OPNAVINST 5100.20C.

PREREQUISITE:

Completion of Heat Stress Program lecture (Supervisory or Non-supervisory).

INTRODUCTION:

A critical element of the Navy's Heat Stress Program is the monitoring of hot spaces. To consolidate the dry bulb, wet bulb and globe temperatures into one index, we use a Wet Bulb Globe Temperature (WBGT) Meter. This meter measures all three temperatures and calculates them into a WBGT Index. We can use the with the Physiological Heat Exposure Limit (PHEL) chart to determine stay-times in hours and minutes, depending on the level of work effort. Heat stress monitors must take WBGT readings accurately and consistently to provide supervisors with accurate heat stress information.

Designated heat stress monitors must be trained in meter use and care, how readings are taken to provide accurate personnel exposure levels, and how to prepare the required reports.

A. HEAT STRESS CONTROL PROGRAM

1. Previous training has explained why the Navy has a heat stress program, how we monitor heat exposure and use stay-times.
2. When we can not decrease heat stress by engineering controls, our only choice is to limit the time we place our people in a heat stress environment.
3. Monitoring the heat stress in an area requires more than just taking dry bulb, or ambient air temperatures. We must take into consideration:
 - a. Dry Bulb Temperature (DB)
 - b. Wet Bulb Temperature (humidity) (WB)
 - c. Globe Temperature (radiant heat) (GT)
 - d. Level of work being performed there
4. The different temperatures taken separately mean little. All three must be taken into account, since they all affect body stress. Researchers developed a calculation giving us a WBGT INDEX:
 - a. $(0.1 \times \text{DB}) + (0.7 \times \text{WB}) + (0.2 \times \text{GT}) = \text{WBGT INDEX}$
 - b. We can use this calculation if each temperature reading had to be taken by a separate thermometer.
 - c. The WBGT meter automatically calculates the index.

SAMPLE PROBLEM: YOUR READINGS ARE DB - 98 DEGREES, WB - 87 DEGREES AND GT - 107 DEGREES. THAT WOULD BE:

$$(0.1 \times 98) + (0.7 \times 87) + (0.2 \times 107) = \\ 9.8 + 60.9 + 21.4 = 92.1 \text{ WBGT INDEX}$$

- c. This calculation is used to "validate" your WBGT Meter (to check your readings)

FOR EXAMPLE, IF YOUR READINGS FROM THE METER WERE THE SAME AS THE SAMPLE PROBLEM, AND THE METER READ 92.0 WBGT, THE CALCULATION ABOVE WOULD BE WITHIN THE VALIDATION LIMIT OF PLUS OR MINUS 0.2. THE READING WOULD SHOW THE METER WAS WORKING AND THE MONITOR DID AN ACCURATE WBGT SURVEY.

- d. This calculation is used to determine the WBGT Index if your meter is broken and you need to use the Motorized Psychrometer (1H 6685-00-935-1389).
- (1) The Motorized Psychrometer has a dry bulb thermometer and a wet bulb thermometer.
 - (2) The "motorized" part is a little fan which blows air over the wet bulb wetted sock to evaporate the water.
 - (3) The Dry Bulb and Wet Bulb readings are used with previous Globe readings for those areas to calculate the WBGT Index.

IF AVAILABLE, DEMONSTRATE MOTORIZED PSYCHROMETER. TAKE A PREVIOUS WBGT SURVEY, NOTE THE GLOBE TEMPERATURE, THEN USE SAMPLE PSYCHROMETER READINGS TO CALCULATE THE WBGT.

B. USE OF THE WBGT METER

SHOW VIDEOTAPE "USE AND CARE OF THE WBGT METER," MAY BE SHOWN.

DEMONSTRATE USING WBGT METER, PASS AROUND CLASS.

1. Assembly is very simple - attach globe to top of meter by inserting the pin into jack.
2. The meter consists of:
 - a. Globe thermometer (black ball on top)
 - b. Tunnel assembly which contains a small fan, a dry bulb sensor and a wet bulb sensor, covered with a white cotton sock.

- (1) The white, cotton sock is attached to a small sponge, which is inserted into a well in the tunnel. This well is filled with distilled water, which is absorbed up onto the sock, keeping it wet. When filling the well, tip the meter to allow the excess to drip out before you use the meter. Allow the sock to dry after meter use, before it is stored in the closed case. This will prevent the moisture from damaging the electronic components.
 - (2) Spare socks are provided with the kit, should the original one become soiled or torn.
- c. On the front of the meter are two knobs and a liquid crystal display.
 - d. The knob on the left has four positions:

DB	WB	GT	WBG
----	----	----	-----
 - e. The knob on the right has three positions:

OFF	CHECK	ON
-----	-------	----
 - f. The meter has rechargeable Ni-Cad batteries and a recharger cord. These batteries have a "memory" and should be discharged completely before recharging. The WBG technical manual discusses recharging.
 - g. There should also be a calibration sticker on each meter. Calibrate the meter annually as required by METRL.

C. TAKING WBG METER READINGS

1. Take WBG meter readings of a heat stress area when they meet the situations outlined in OPNAVINST 5100.20C:

DISTRIBUTE HANDOUT #1- WBG Meter Monitoring Situations AND READ OVER HANDOUT

2. Take dry and wet bulb temperatures readings outside (weather decks) before and after each set of readings.
3. Begin your set of readings at the work or watch station reporting the highest dry bulb temperature or heat stress condition.

4. Allow the meter to equalize before beginning the readings. Each sensor position should stabilize. The sensor is stabilized when the reading fluctuates slowly plus or minus 0.1 degree. The globe setting takes the longest to stabilize.
5. Take readings at each work station close to the area where the individual works.
6. Take readings in the flow of a spot cooler, if that is where the individual stands. Hold the meter so the spot cooler air flow comes into the fan side of the meter, with the meter chest high and at arm's length from the body.
7. Take readings in the order of the meter knob positions:

DB	WB	GT	WBGT
----	----	----	------
8. The wet bulb sock should be checked periodically to ensure it remains wet. If the dry bulb and wet bulb readings are nearly equal, it means the sock may be dry. The wet bulb reading should always be the lowest temperature.

ADDITIONAL INFORMATION ON USE OF THE WBGT METER CAN BE FOUND IN OPNAVINST 5100.20C AND NAVSEA TECHNICAL MANUAL NAVSEA SN000-11-MMO-010

D. RECORDING HEAT STRESS READINGS

1. Each ship will have a heat stress monitoring form, similar to the ones in OPNAVINST 5100.20C.

NOTE: USE YOUR OWN SHIP'S FORM AS HANDOUT #2.

2. The form will have:
 - a. Spaces to record the WBGT reading for each location surveyed.
 - b. Spaces to record the weatherdeck (outside) before and after dry bulb and wet bulb readings.
 - c. Spaces to record the PHEL chart readings for the desired PHEL curves.
 - d. Spaces for comments during routing.
3. The reading results must be routed through the chain of command for the cognizant area (Chief Engineer for engineering spaces or Supply Officer for supply spaces).

4. If the stay-times are less than the work or watch time, walk the results through to the Commanding Officer or CDO.
5. Leave a copy of the results with the supervisor (EOOW, BTOW, galley watch captain), if possible.
6. Always write on the form other information such as the ship's speed, RPMs, sea water injection temperature, if scuttlebutts are working, water in the bilges, and steam leaks.

D. USING THE PHYSIOLOGICAL HEAT EXPOSURE LIMIT (PHEL) CHART

DISTRIBUTE HANDOUT #3- COPY OF THE PHEL CHART FROM OPNAVINST 5100.20C

1. PHEL chart was developed to account for how hard and individual is working in a heat stress area, since this impacts on their body's stress.
2. PHEL curves are numbered I, II, III, IV, V, and VI. The lowest level of work is Curve I. The most strenuous work is Curve VI.
3. A General PHEL Curve Applicability Table in OPNAVINST 5100.20C lists recommended PHEL curves for routine operations and casualty control drills. The supervisor determines other curves to apply.

DISTRIBUTE HANDOUT #4 - PHEL CURVE GENERAL APPLICABILITY
EXAMPLE: THE EVAPORATOR WATCH STATION ROUTINE WATCH WOULD BE PHEL CURVE I. THE SAME WATCH STATION DURING CASUALTY CONTROL DRILLS WOULD BE PHEL CURVE II. SCULLERY PERSONNEL ARE ALWAYS UNDER PHEL CURVE V.

4. Situational, non-routine operation PHEL curves would be determined by the supervisor.
5. The heat stress monitor provides the supervisor with all applicable curves listed on the report, so the supervisor may then apply the appropriate stay-times.
6. If stack gases affect personnel, reduce PHEL stay-times by 66% (about two-thirds).
7. When using the PHEL chart, and the WBGT is ---.5 or greater, round off the WBGT reading to the next higher WBGT. For example: The WBGT is 102.5. Read the curves for a WBGT on the chart of 103.0. If in doubt, always round up in the interest of the personnel (shorter stay-time).

DISTRIBUTE HANDOUT #5 - ADMINISTER AND MONITOR EXERCISE.
USE THE ANSWER KEY PROVIDED. YOU CAN USE THE HANDOUT FOR
DISCUSSION BEFORE THE QUIZ.

SUMMARY:

WBGT readings determine personnel protection under the heat stress program. Information gained by heat stress monitors is used to set stay-times and recovery times for workers. The stay-times are only as good as your WBGT meter readings. Accuracy is vital. All personnel designated to conduct heat stress monitoring should be trained and qualified.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.20C.

ADMINISTER 10 QUESTION QUIZ INCLUDED WITH THIS LESSON.
REPRODUCE LOCALLY. QUIZ ANSWER KEY IS PROVIDED.)

HANDOUT #1- HEAT STRESS MONITORING SITUATIONS

NOTE: PROMULGATION OF THE NEW OPNAVINST 5100.20D MAY ALTER THESE CRITERIA. CHECK YOUR REFERENCES.

In accordance with OPNAVINST 5100.20C, heat stress surveys must be conducted:

1. When watch or work station dry-bulb temperature exceeds 100 degrees Fahrenheit.
2. When conditions of unusually high heat or moisture are present.
3. Prior to conducting engineering casualty control drills.
4. As determined by higher authority (for example, CO, XO, CHENG, or EOOW)
 - a. Operations in hot, humid climates
 - b. Exceptionally arduous work in progress
 - c. Restoring the engineering plant after an actual casualty

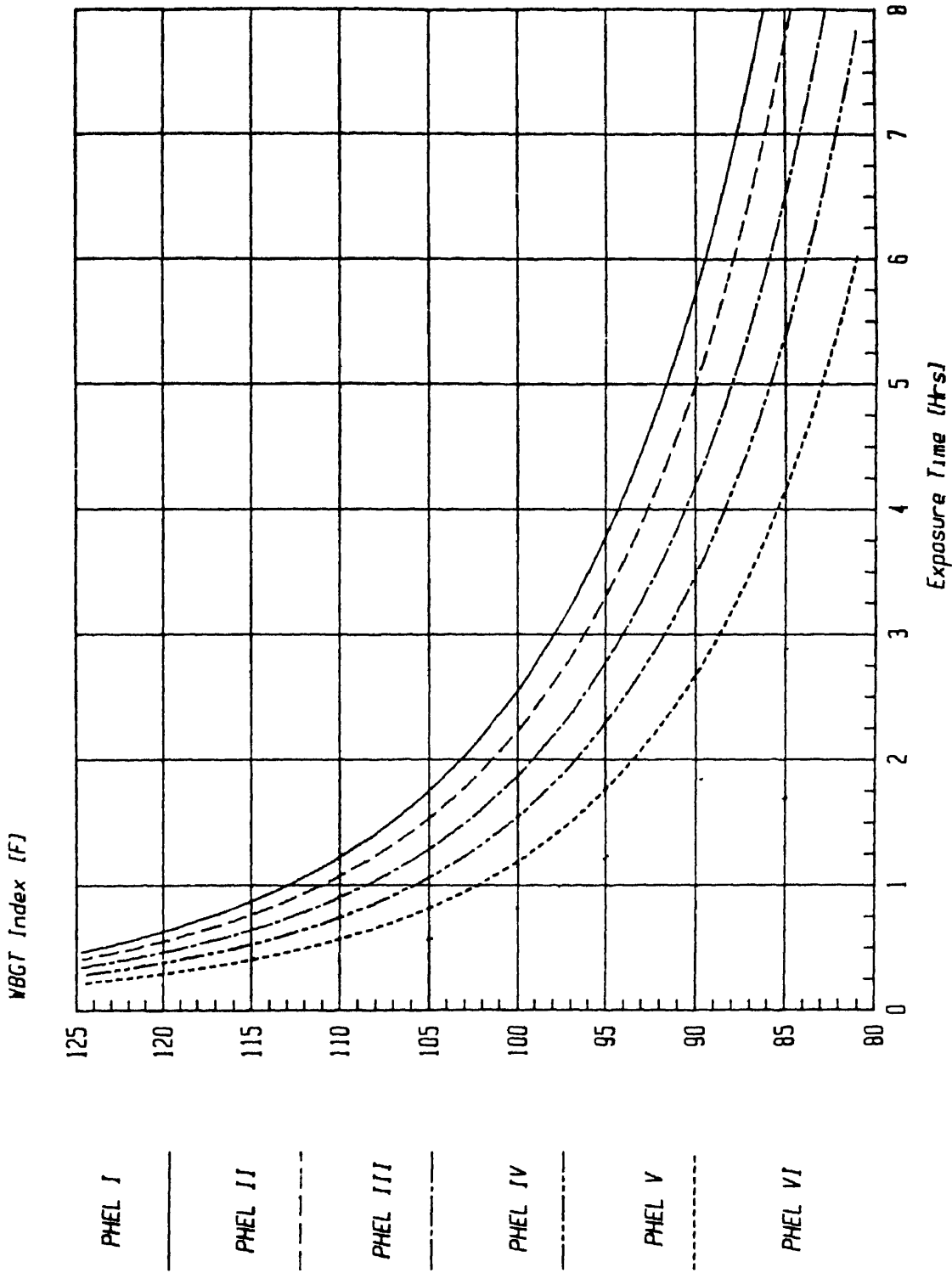
WBGT Meter readings will be repeated:

1. If computed watchstander or worker stay-times are greater than the duration of the watch or work periods (normally 4 hours), conduct the next survey during the hottest part of the day. If the computed stay-times are greater than the normal watch or work period at the hottest part of the day, then only two heat stress surveys are required each day.

2. If computed stay-times are less than the scheduled duration of watch or work periods, the frequency of conducting heat stress surveys must be increased to a minimum of once per stay-time interval at the affected stations. Repeat the WBGT reading at any such work station prior to the end of that original stay-time to determine the stay-time for the relief watchstander.

WBGT Meter readings may be required for weather decks, on occasion. In such cases, consult NAVMED P-5010-3.

PHEL CHART
[Curves I - VI]



PHEL CURVE GENERAL APPLICABILITY

PERSONNEL	PHEL CURVE	
	Routine Watch	Casualty Control Drills
I. Steam Propelled Ships		
A. Fire Room		
1. BTOW	II	II
2. ABC Console Operator	I	I
3. Upper Levelman	II	III
4. Lower Levelman	III	IV
5. Burnerman	II	III
6. Messenger	III	IV
B. Engine Room		
1. EOOW	I	I
2. MMOW	II	III
3. Throttleman	I	I
4. EMOW	I	I
5. Upper Levelman	II	III
6. Lower Levelman	II	III
7. Evaporator Watch	I	II
8. Messenger	III	IV
C. Auxiliary Spaces (CV's & FF 1052's)		
1. Upper Levelman	II	II
2. Lower Levelman	II	II
D. Steam Catapult Launch Control Room		
1. All Watch Personnel	II	II
II. Diesel Propelled Ships		
A. EOOW	I	I
B. POOW	II	III
C. EMOW	I	I
D. Throttleman	I	I
E. Repair Electrician	I	I
F. SSDG Watch	I	I
G. Boiler Watch	I	I
H. Evaporator Watch	II	II
G. Oiler/Messenger	III	IV

PERSONNEL

PHEL CURVE Routine Casualty Watch Control Drills

III. Gas Turbine Propelled Ships

A. All Engineering Watch Personnel	I	II
------------------------------------	---	----

IV. All Ships and Submarines

A. Engineering Casualty Control Evaluation Team (ECCET)	NA	II
B. Roving Watch Personnel	III	III
C. Laundry Personnel	III	NA
D. Scullery Personnel	V	NA
E. Galley & Food Service Line Personnel	II	NA
F. Fleet Training Group Instructors and other off-ship Engineering Observers	I	II
G. Personnel conducting heavy repairs or other strenuous work	VI	VI

HANDOUT #5- HEAT STRESS MONITOR EXERCISE

RATE/NAME: _____ DIV: _____ DATE: _____

USE HANDOUTS #3 AND #4 TO ANSWER THESE PROBLEMS.

1. You have just completed heat stress readings in the Galley. People in the Galley are just cleaning up from supper and will finish their work shift in 35 minutes. All the dry bulb thermometers read greater than 100 degrees Fahrenheit. You get the following WBGT readings:

At oven front = 91.5 WBGT
At serving line = 83.0 WBGT
At deep sink = 87.3 WBGT

- a. Galley and Food Service Line Personnel fall under which PHEL Curve? _____
- b. What would be the stay-time for personnel at the oven front? _____
- c. What would be the stay-time for personnel at the serving line? _____
- d. What would be the stay-time for the personnel at the deep sink? _____
- e. When would you take your next survey in these locations?

2. You have completed a survey of the fireroom. The WBGT reading at the upper levelman watchstation is 96.0. This is a routine watch. The watchstander is complaining that the fuel vapors and stack gases are making his eyes water. You also notice the strong smell of stack gases.

- a. What PHEL Curve applies to this watchstander?

- b. What is the stay-time for a WBGT reading of 96 ?

- c. What would be this watchstanders stay-time?

- d. What would be this watchstanders recovery time?

HEAT STRESS MONITOR EXERCISE KEY

1.
 - a. II
 - b. Four hours and 10 minutes (if .5 or higher, round off to the next higher PHEL WBGT. In this case, for 91.5 look at the 92.0. Always round off to the safer side.)
 - c. Greater than eight hours
 - d. Six hours and 30 minutes
 - e. You wouldn't take any other readings, since they are securing the work shift in 35 minutes and it is the last meal of the day. If another shift comes on later, for mid-rats for example, the thermometers would be recorded at the beginning of that work shift. If there were still readings over 100 degree, they would call for another WBGT survey. If it were a continually manned work station, you would have taken the next set of readings before the end of the 4 hour 30 minute stay time.
2.
 - a. The Upper levelman's PHEL Curve for routine work is II.
 - b. The stay-time is three hours for a WBGT of 96 on Curve II.
 - c. Taking into account stack gases, the PHEL would be lowered by 66% (about two-thirds) of the original time. The result = one hour stay-time.
 - d. The recovery time is twice the stay-time, up to four hours. This watchstander's recovery time would be two hours on the stack gas PHEL.

HEAT STRESS MONITOR QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. The Physiological Heat Exposure Limit (PHEL) gives the stay-times for average people, and may be less if the worker is ill, tired, or not acclimatized.

- a. True
- b. False

2. WBGT meter readings must be taken during Full-Power engineering plant operations.

- a. True
- b. False

3. If the computed stay-time is 1 hour 30 minutes, the recovery time must be 4 hours.

- a. True
- b. False

4. If the Wet Bulb temperature reading is the same as the Dry Bulb temperature reading, then:

- a. The humidity is high.
- b. The wet bulb sock may have dried out.
- c. The reading was taken too fast.
- d. The globe temperature will be low.

5. If the watchstander is not standing in the air flow of a spot cooler, the WBGT reading should still be taken under the cooler.

- a. True
- b. False

6. The outside air temperature and humidity has little affect or the ship's internal temperature.

- a. True
- b. False

7. The PHEL curve used for the most arduous work is curve:

- a. I
- b. II
- c. IV
- d. VI

8. If you conducted a WBGT Meter survey at 1700, and the Stay-time at that station was two hours, you must conduct the next survey at or before:

- a. 1730
- b. 1850
- c. 1900
- d. 1930

9. If you conduct a validation of the meter and the calculation is greater than + or - 0.2 of the direct reading, it means:

- a. The meter needs to be sent for calibration.
- b. The globe was missing.
- c. The meter had not stabilized when the readings were taken.
- d. Both a and c.

10. Heat stress surveys must be conducted every day that the engineering plant is operating.

- a. True
- b. False

HEAT STRESS MONITOR QUIZ KEY

1. A
2. B
3. B (The correct answer is three hours.)
4. B
5. B
6. B
7. D
8. B
9. D
10. B

LG #5

LESSON TOPIC: HEARING CONSERVATION PROGRAM

AVERAGE TIME: 30 Minutes (add 18 minutes for videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B4

TRAINING AIDS:

- a. Several sets of ear plugs, ear muffs, and noise signs
- b. Videotape: "Hearing Conservation - Shipboard" (43138-DN)
- c. Sound Level Meter (if available)
- d. Quiz

OBJECTIVES:

The student should be able to identify the causes of hearing loss, understand the difference between temporary and permanent hearing loss, and remember the Navy's hazardous noise level. Each student should be familiar with the types of hearing protection available, know how to select the appropriate hearing protection, and realize the purposes of audiometric testing, and the parameters of the Navy Hearing Conservation Program.

TARGET AUDIENCE:

All hands, including supervisory personnel.

REQUIREMENT:

Initial and annual training for all personnel exposed to hazardous noise levels, in accordance with OPNAVINST 5100.19B.

INTRODUCTION:

Hazardous noise environments are common aboard ship because of engine machinery noises, chipping hammers and needle guns, and many other noisy operations. The Navy pays more than one-half million dollars daily on compensation claims, many because of hearing loss. Permanent hearing loss from continuous noise exposure is preventable. The Navy has a program to ensure noise hazardous areas are identified; hazardous noise is eliminated, if possible; hazards are posted; personnel are provided with protective equipment; and testing is conducted to monitor program compliance.

A. BACKGROUND

1. Noise is unwanted sound created by many sources, such as loud machinery, city traffic, industrial equipment, and loud music. Aboard ship, noise is produced by the propulsion plant machinery, diesel engines, gunfire exercises, pneumatic and electrical tools, and ventilation.
2. Excessive noise, at certain levels over a period of time, can cause hearing loss.
3. Noise exposure is determined by:
 - a. Duration of exposure to noise
 - b. Type of noise
 - (1) Continuous noise
 - (2) Impulse or sudden, loud noise
 - c. Intensity of noise
 - d. Frequency of noise
4. Hearing losses can result from several causes:
 - a. Age (Younger people are losing their hearing earlier due to noise exposure.)
 - b. Disease (middle or inner ear)
 - c. Trauma (burst ear drum)
 - d. Drugs (for example, the ". . . mycins") like tetracycline
 - e. Noise exposure

5. More than 20 million Americans have measurable hearing losses.
6. An additional 16 million are exposed to on-the job noise levels that may permanently damage their hearing.

B. HOW HEARING LOSS OCCURS

1. Damage to Ear
 - a. Outer ear - catches dirt and particles in the canal which has cerumen or wax.
 - b. Middle ear - has bones and ear drum which can rupture from sudden high levels of sound pressure or can break the bones. Surgery can frequently repair these types of hearing loss.
 - c. Inner ear - has cochlea, snail shaped organ containing tiny hair cells connected to nerve endings. Sound vibrations stimulate these hair cells and send signals to the brain. If the hair cells are damaged by continuous noise, they cannot be surgically repaired, and will not regrow.

C. MEASURING SOUND

1. Frequency - measured in hertz (Hz) or cycles per second.
 - a. Determines how high or low the pitch sounds.
2. Intensity - measured in decibels (dB)
 - a. Determines how loud a noise sounds
3. How well you hear sound also depends on the pitch, your age, distance from source, position of source, previous exposure and surroundings.
4. Sound level meters are used to measure both the intensity of different frequencies of noise and to give us a decibel reading. For example, 10 decibels is very faint sound, like the wind through trees on a still day. A painfully loud 150 decibels have been measured behind an F-14 during take-off from a carrier.
5. Navy Industrial Hygiene Officers from the NEPMU or the tender have sound level meters and conduct noise surveys.

SHOW "HEARING CONSERVATION- SHIPBOARD" VIDEOTAPE, IF AVAILABLE.

D. THE NAVY HEARING CONSERVATION PROGRAM

1. The objective of the Hearing Conservation Program is to prevent hearing loss as a result of exposure to hazardous noise.
2. The elements of the program are:
 - a. Identifying noise hazardous areas.
 - b. Using engineering controls to reduce noise hazards, wherever possible.
 - c. Posting of noise hazardous areas where engineering controls are not feasible or as an interim measure.
 - d. Providing personal hearing protection to workers in noise hazardous areas.
 - e. Monitoring workers hearing by regular audiometric testing.
 - f. Educating people exposed to noise.

E. PROGRAM ELEMENTS.

1. Identifying noise hazardous areas.
 - a. Department of Defense hazardous noise limit for continuous noise exposure is 85 or more decibels or dB(A). The OSHA limit is 90 decibels or dB(A). The DoD standard is more strict than OSHA. The impact noise limit is 140 decibels.
 - b. Personnel can be exposed to 84 decibels or below for eight hours per day, five days per week with no ill effects. At 85 decibels or above (continuous noise), the Navy considers the level as hazardous.
 - c. Sound Level Surveys are conducted to determine which spaces routinely have noise levels above 84 decibels continuous noise or 140 decibels impact noise.
 - d. Sound Level Survey documents are retained onboard and readings are repeated after Regular Overhaul (ROH), or when any equipment is changed that may have an effect on the noise level. The readings are reviewed at each 18 month industrial hygiene survey and checked or repeated, if necessary.

2. Engineering controls

- a. Engineering controls are accomplished as part of new construction or overhaul, by SHIPALTs, or by Intermediate Maintenance Activities.
- b. Controls for noise are carefully researched and applied to submarines to decrease waterborne noise.
- c. Sometimes noise can be decreased by changes in design or imposing controls.
- d. Damping material or sound absorbing curtains can be placed around noisy equipment.
- e. In rooms requiring quiet, such as classrooms, acoustical tiles are added to ceilings and walls.
- f. Rubber insulating pads can be placed on equipment foundations to prevent metal-to-metal contact and sound transmission.
- g. Moving noisy equipment to an isolated area also works to reduce noise hazards.
- h. Engineering controls must be considered first, before resorting to ear plugs and ear muffs.

3. Posting Noise Hazard Signs

- a. When engineering controls do not work, or when they aren't feasible, the noise hazardous areas must be posted to warn personnel.
- b. Use the ORANGE or YELLOW Hazardous Noise signs or stickers to mark noise hazards. (SHOW SIGNS.)
 - (1) Large stickers are used to designate an entire shop or space is noise hazardous.
 - (2) Small stickers are used on individual pieces of equipment or tools to indicate they are produce hazardous noise.
- c. Areas are posted as requiring double hearing protection (ear plugs and ear muffs) if the noise level exceeds 104 decibels.

4. Personal Protection

- a. When personal protection is required because noise exposures can not be controlled by other means, the Navy provides the protective equipment.
- b. Ear plugs and ear muffs mechanically block the noise from reaching inner ear.
- c. These devices are rated for a specific NRR, or Noise Reduction Rating. When tested, they reduced the noise reaching the ear by the number of decibels listed in the product information. An earplug with a NRR of 30 would reduce a 90 decibel noise to 60 decibels reaching the inner ear.
- d. Ear plugs physically fit into the ear canal:
 - (1) Fitted, flanged ear plugs are issued only by Medical personnel. They determine your ear canal size and the correct size of ear plug.

SHOW THE VARIOUS FLANGED TYPE EAR PLUGS. DEMONSTRATE HOW TO INSERT THEM. INSERT THEM BY PULLING UP ON THE EAR AND INSERTING THE PLUG IN AND UPWARD TO GET A GOOD SEAL.

- (2) Disposable foam expandable earplugs can be issued by any division without prior fitting. These foam type ear plugs usually have the highest NRR (33 decibels) (Higher than ear muffs!)

SHOW THE FOAM EAR PLUG. DEMONSTRATE INSERTION BY ROLLING THE FOAM PLUG INTO A POINT, PLACING IN THE EAR PUSHING UPWARD, AND KEEPING THE FINGER OVER THE PLUG UNTIL FULLY EXPANDED.

- e. Ear muffs or ear caps fit over the outer ear:
 - (1) Ear muffs (Mickey Mouse ears) have an NRR of about 24 - 28 decibels when wearing the band over the head.
 - (2) Ear caps are like ear plugs on a head band and may fit slightly into the ear canal. These generally have an NRR around 22 decibels.
- f. Double hearing protection is specified for areas where the sound level is 104 decibels or greater. Ear muffs are worn over the ears, with ear plugs in the ears to give the highest level of protection.

- g. Hearing protection must be kept clean and in good condition to work. Dirty ear plugs can spread infections. Ear muffs with hardened seals or missing foam inserts are useless.

5. Hearing Testing

- a. Baseline and routine testing is required for personnel working in noise hazardous areas to monitor any hearing losses.
- b. ALL naval personnel are given a baseline or reference audiogram when entering the service.
 - (1) The reference audiogram is used for comparison to future hearing tests to note changes in hearing.
- c. All personnel assigned to work in a noise hazardous area or job are given annual monitoring audiograms.
 - (1) If a change in hearing is noted during the annual test, follow-up testing may be required.
 - (2) The level of sound when you just begin to hear the faint tone is called your threshold of hearing. When your threshold changes, it is called a threshold shift. If the change is 15 decibels or more, it is called a Significant Threshold Shift (STS). This shift may show a potential hearing loss, which the Corpsman will discuss with you.
 - (3) If you have an STS, you may be scheduled for a follow-up hearing test 15 hours, 40 hours and/or five days in a noise free environment. You should avoid exposure to noise until after the follow-up test.
 - (4) If the problem persists, you may be referred to a specialist (Audiologist) for more comprehensive hearing tests.
- d. Every member leaving the service is given a termination audiogram.

SUMMARY:

Hazardous noise levels are a fact of life on board ships. Every effort has been made to keep noise below hazardous levels, but there are still situations where only hearing protection will suffice. The Navy program was developed to identify these noisy areas, post warnings, provide protective equipment, and routinely test our sailor's hearing.

FOR MORE INFORMATION, CONSULT OPNAVINST 5100.19B, OR TALK TO YOUR MEDICAL DEPARTMENT REPRESENTATIVE.

ADMINISTER 10 QUESTION QUIZ ON THIS HEARING CONSERVATION LESSON. QUIZ AND KEY ARE PROVIDED. REPRODUCE LOCALLY.

HEARING CONSERVATION PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. Continuous exposure to high noise levels will only cause a temporary hearing loss.
 - A. True
 - B. False
2. Ear muffs provide more hearing protection than foam ear plugs.
 - A. True
 - B. False
3. Which of the following situations require hearing protection?
 - A. Operating machinery in an area posted with noise signs.
 - B. Operating a deck grinder.
 - C. Chipping paint with a hammer.
 - D. Working in the engineroom underway.
 - E. All of the above.
4. Audiograms measure changes in your hearing ability.
 - A. True
 - B. False
5. Audiograms are required for every sailor:
 - A. Biannually.
 - B. When you enter and leave the service.
 - C. Annually.
 - D. Every ten years.
 - E. Every five years.
6. Permanent hearing loss from continuous noise exposure is noticeable immediately.
 - A. True
 - B. False

7. Double hearing protection is:

- A. Extra large ear caps.
- B. Ear muffs worn over ear plugs.
- C. Not required on board this ship.
- D. Mandatory for deaf sailors.
- E. Only necessary in the engineering spaces.

8. More hearing losses occur off-duty than on-duty among Navy personnel.

- A. True
- B. False

9. You must keep reusable ear plugs clean to prevent ear infections.

- A. True
- B. False

10. During a hearing test, the threshold of hearing refers to the level at which you just begin to hear the tone.

- A. True
- B. False

HEARING CONSERVATION QUIZ KEY

1. B
2. B
3. E
4. A
5. B
6. B
7. B
8. A
9. A
10. A

G #6

LESSON TOPIC: SIGHT CONSERVATION AND EYE SAFETY

AVERAGE TIME: 30 minutes (add 20 minutes for either videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B5
- b. American National Standard ANSI Z87.1-1979
Practice for Occupational and Educational Eye
and Face Protection (if available)

TRAINING AIDS:

- a. Videotape: "Caution: Eyes at Work" (21760-DN)
or "Straight Talk on Eye Safety" (22070-DN)
- b. Samples of safety glasses and face shields.
- c. Handout #1 - Types of Protective Eyewear
- d. Sample EYE HAZARD sign, NSN 9905-01-100-8203

OBJECTIVES:

The student should be able to identify the types of eye hazards, types of eye protection required for certain hazards, understand how an emergency eye wash and deluge shower work, and the first aid for eye injuries.

AUDIENCE:

All hands, non-supervisory and supervisory, who are exposed to eye hazards and required to wear eye protection.

EQUIPMENT:

Annual training for all hands working in eye hazardous areas, in accordance with OPNAVINST 5100.19B.

INTRODUCTION:

Eye injuries cost industry \$300 million each year in compensation and lost work time. The loss of any sight can be devastating and is easily preventable. The Navy has a sight conservation program to identify eye hazardous situations, post those hazards, and provide personal protection.

A. YOUR EYE'S DEFENSES

1. Tears self-clean the eyes of foreign materials and irritants.
2. The eye lid is a physical barrier to foreign materials, but not against sharp objects.
3. A damaged cornea (outer transparent layer over lens) can sometimes be repaired with a transplant.
4. Damage to inner eye (retina) cannot be corrected.

B. TYPES OF EYE INJURIES

1. Foreign bodies

- a. Most common eye injury.
- b. Abrasions, or scratches to the cornea from dust or chips - may cause permanent scar tissue.
- c. Contusions from large objects - cut into eye.
- d. Irritation from fibers, such as fiberglass.
- e. Particles in smoke or fumes.

2. Chemical burns

- a. Gases in air can burn or irritate.
- b. Acids precipitate a protein barrier preventing further penetration. Acid burns the surface of the eye and cause scars.
- c. Alkalies (oven cleaners) continue to damage tissue as long as they are in contact with the eye by dissolving fat soluble tissue, turning it into jelly.
- d. Vapors and mists from aerosols can irritate and scar eye tissue (paints, pesticides, and cleaners).

- e. In the Navy, the most frequent eye injuries result from handling fuels without using eye protection.

3. Irradiation burns

- a. Infrared light passes through the cornea and is absorbed by the lens and retina, common in civilian production lines (heat lamps).
- b. Ultraviolet light (electric welding arc, sunshine) affects the cornea and outer eye, causes "flash burns" 4 - 6 hours after exposure, and takes 24 - 72 hours to heal.
- c. Both Infrared and ultraviolet light can cause permanent eye damage or damage sight.

SHOW VIDEOTAPE "CAUTION~ EYES AT WORK" OR "STRAIGHT TALK ON EYE SAFETY," IF AVAILABLE.

C. NAVY SIGHT CONSERVATION PROGRAM ELEMENTS

- 1. Identify eye hazards.
 - a. Survey all work areas to determine eye hazards.
- 2. Eliminate eye hazards by engineering controls
 - a. Eliminate eye hazards, where possible.
 - b. Reduce eye hazards with guards, by isolating the process, or by substituting a less harmful chemical.
- 3. Post eye hazardous areas.
 - a. Label all areas and pieces of equipment which are potentially eye hazardous.
 - b. Restrict passage through eye hazardous areas, if necessary,
 - c. Use yellow and black caution signs area to warn of eye hazards or to specify the protection required.

SHOW EYE HAZARD SIGN, IF AVAILABLE

- d. Mark the areas around an eye hazard with yellow and black striping or checkerboard tape on the deck. For example, outline the operator area in front of a bench grinder as an eye hazard area.

4. Provide Protection.

- a. Where eye hazards cannot be eliminated or reduced, personal protective equipment may be necessary.
- b. Medical provides eye exams and screening to determine corrective needs.
- c. Special medical eye screening may be required for personnel working around radiation sources.
- d. The Navy must provide all protective equipment.
- e. The Safety Officer will determine what types of eye protection must be worn for certain hazards.
- f. Eye protection is specific to the job.

D. Eye Protection - Personal Protective Devices

- 1. Must meet strict ANSI manufacturing standards.
 - a. Each manufacturer's glasses or goggles must be tested and approved.
 - b. Testing includes impact, permeability, shatter proofing, and frame breaking strength.
 - c. ONLY ANSI APPROVED safety eye wear may be used by Navy personnel. Each item will have "Z-87" stamped on it showing it meets ANSI standards.
 - 2. Each style and type of safety eye wear is designed for a specific hazard.
 - a. There are six general types of protective eye wear
- PASS OUT HANDOUT #1, AND GO OVER EACH TYPE OF EYE WEAR IN THE HANDOUT
- b. The wrong type of eye protection for the job can be dangerous.

- c. When handling strong acids and alkalies, "double" eye and face protection is necessary. This means you wear a face shield over a pair of chemical goggles.
- d. Face shields alone do not provide eye protection. They must be worn with safety glasses or goggles.
- e. When working around ultraviolet light (welding or burning), protection is selected for the level of light intensity. Different shades of lenses are specified for jobs. Do not substitute sun glasses for proper eye protection.
- f. The Navy will provide prescription safety glasses, if needed for the job. They may be ordered through your Safety Officer or Medical Department Representative.
- g. Regular prescription glasses cannot be worn as safety glasses. Shatter-resistant glasses could still cause damage to the eyes from impact accidents.
- h. Keep safety devices clean. Since they are inexpensive, most goggles and safety glasses should be replaced if badly scratched or damaged.

E. EMERGENCY EYE WASH STATIONS

- 1. First aid for most eye injuries is flushing with fresh water for 15 minutes.
- 2. Flushing is used to remove particles and dilute strong chemicals.
- 3. Emergency eye wash stations are designed to provide eye first aid.
 - a. Must be designed to meet strict ANSI standards.
 - b. Must provide continuous water flow, plumbed units, or a minimum flow rate of 0.4 gallons per minute for 15 minutes for portable units.
 - c. Must be activated by one hand or foot motion.

- d. Water must remain flowing (valve stays open), and hands must be free to hold eyes open.
 - e. May be combined with a deluge shower for full body chemical first aid.
- 4. Emergency eye washes are required wherever corrosives are used, such as a battery locker using acids, and where particulate hazards exist, such as a machine shop.
- 5. OPNAVINST 5100.19B, Chapter B5 provides a complete list of compartments and processes requiring an eye wash or deluge shower.
- 6. There are several styles of eye wash stations authorized for shipboard use:
 - a. Plumbed into the ship's potable water system.
 - b. Pressurized tank-type eye wash, which is portable and can be located where plumbed water is not feasible.
 - c. Gravity-fed portable self-container eye wash, with 14 ~ 16 gallons of water normally, and placed where plumbing is not feasible.
 - d. All three are covered by a weekly or monthly PMS.

F. PROGRAM ENFORCEMENT

- 1. Personnel working in eye hazardous areas where protection is required, must always wear eye protection.
- 2. Supervisors must set the example.
- 3. Guests in work areas must also be provided with eye protection.
- 4. Personnel working at hobbies or at home should be encouraged to use eye protection.
- 5. Sports, such as racquetball, can be eye hazardous. Sport goggles should be issued with recreational equipment.

G. EYE INJURY FIRST AID

- 1. Never rub the eyes to remove particles or if eyes are irritated.

2. For chemical burns, flush with fresh, cool water for a full 15 minutes, then report to medical.
3. For punctures and eye trauma, cover eye gently with a soft cloth and get medical treatment.
4. Report all minor cuts and eye problems to medical. A minor scratch could lead to an eye infection possibly causing scar tissue and loss of sight.

SUMMARY:

There are many processes and work situations on board ships which are a potential hazard to the eyes. The most frequent minor mishap in ships is corneal abrasions from particulates falling or blowing in the eyes. Many jobs, such as dusting the overheads, can be eye hazardous and may require eye protection. Remind people their sight is worth more than a few minutes of their time to put on a pair of goggles.

FOR MORE INFORMATION, CONSULT OPNAVINST 5100.19B CHAPTER B5, OR TALK TO YOUR SAFETY OFFICER.

ADMINISTER 10 QUESTION QUIZ ON THIS SIGHT CONSERVATION LESSON. QUIZ AND KEY PROVIDED. REPRODUCE LOCALLY.

Appendix B5-B

TYPES OF PROTECTIVE EYEWEAR

Appropriate eye and face protection is required in all areas that are designated as eye hazardous. A selection chart for eye and face protection for different work operations, and a welding filter shade protection chart, are shown in Tables B5-B-1 and -2. Stock numbers that can be used to order equipment are listed in Table B5-B-3. The following is a short description of the various types of protective eyewear:

- a. Safety Glasses/Spectacles. Safety glasses are to be worn in those areas where there is a possibility of flying objects, particulates, mists, or vapors entering the eye. Those spectacles with suitable filter lenses are permitted for use with gas welding operations on light work and for inspections. Spectacle-type goggles are made both with and without metal side-shields and may have either a rigid nonadjustable or adjustable metallic bridge.
- b. Chemical Goggles. Chemical goggles provide the eyes and eye area with protection from liquids, splashes, mists, and spray. Goggles may consist of a flexible frame or a rigid frame with a separate, cushioned fitting surface, and are held in place with a supporting band. Chemical goggles with ventilation must be splash resistant.
- c. Welding Goggles. Welding goggles provide protection against glare and injurious radiation, as well as from flying objects, chips, and metal splashes. Eyecup-type goggles are designed to be worn alone, while cover-type goggles are designed to fit over corrective spectacles. The lens filter of welding goggles is shaded to protect the eyes from ultraviolet, infrared, and visible rays generated by the work operations.
- d. Chipping Goggles. Chipping goggles protect the eyes from relatively large flying objects generated by such operations as chipping, lathing, grinding, and chiseling. Eyecup-type goggles may be worn alone, or cover-type goggles may be fitted over corrective spectacles.
- e. Welding Helmets. Welding helmets are made up of a bowl-shaped or modified bowl-shaped device equipped with a Shade 14 or greater filter. These helmets are designed for use during various kinds of arc welding and heavy gas cutting and provide the welder's eyes, face, ears, and neck with protection against intense radiation and weld spatter.
- f. Face Shields. Face shields provide protection to the face and neck from flying particles, liquids, or sprays. Face shields alone do not provide adequate protection against these hazards and must be worn with protective eyewear.

SIGHT CONSERVATION PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER

1. Most eye injuries cannot be prevented.
 - A. True
 - B. False
2. If your regular prescription glasses are made of heavy glass, they can be used as safety glasses.
 - A. True
 - B. False
3. The Navy's sight conservation program
 - A. Gives every sailor a pair of safety glasses.
 - B. Posts any area where an eye injury has occurred.
 - C. Does not pertain to welders.
 - D. Eliminates eye hazards, if possible.
4. Only non-vented or indirectly vented goggles can be used for handling chemicals.
 - A. True
 - B. False
5. Any dark glasses or sunglasses can be used by the firewatch.
 - A. True
 - B. False
6. A face shield is all you need to wear as eye protection while grinding.
 - A. True
 - B. False
7. The best way to remove a particle from the eye is to rub briskly.
 - A. True
 - B. False

8. Eye wash stations must provide at a minimum how many minutes of water flow?

- A. 20
- B. 5
- C. 15
- D. 30

9. Flash burns to the eyes from a welding arc cause immediate pain.

- A. True
- B. False

10. Most eye injuries to Navy personnel occur from:

- A. Working at home
- B. Cleaning and field day
- C. Working with grinders
- D. Working on their car

SIGHT CONSERVATION QUIZ KEY:

1. B
2. B
3. D
4. A
5. B
6. B
7. B
8. C
9. B
10. B

LG #7

LESSON TOPIC: ELEMENTS OF THE RESPIRATORY PROTECTION PROGRAM

AVERAGE TIME: 45 Minutes (add 14 minutes for videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B6

TRAINING AIDS:

- a. Videotape: "Shipboard Respiratory Protection for the User" (805009-DN)
- b. Variety of respirator masks for demonstration
- c. Handout #1 - Respiratory Protection Program
- d. Quiz

OBJECTIVES:

The student should understand the basic elements of the respiratory protection program, including types of air contaminants, respirator selection, fit-testing, and the maintenance and storage of respirators.

AUDIENCE:

All hands, supervisory and non-supervisory, who may be issued and required to use respiratory protection.

REQUIREMENT:

Initial and annual training for respirator users, in accordance with OPNAVINST 5100.19B.

INTRODUCTION:

Your health depends on breathing clean air. In an industrial environment, or when using certain cleaning agents, your breathing air may become contaminated. Inhaling the air contaminants can be hazardous to your health. Engineering controls, such as ventilation, are used to reduce contaminants in the air in the workplace. Where controls are not available, or until they are installed, personal protective equipment, such as respirators, may be required.

A. HEALTH HAZARDS OF AIR CONTAMINANTS

1. Air contaminants enter the body through the lungs.
2. Mucus and small, hair-like structures help cleanse the upper lungs, nose and throat of air contaminants, but very small particles, gases, and vapors may pass deep into the lungs. Air contaminants may cause illness:
 - a. By direct damage to the lungs
 - b. By damage to other body organs as a result of blood distributing the contaminant to other parts of the body.
3. Air contaminants may be classified as:
 - a. Dusts - Particles from grinding, sanding and milling.
 - b. Mists - Fine liquid particles from spraying.
 - c. Fumes - Particles of condensed molten metal from welding operations.
 - d. Gases - Invisible contamination from chemical processing or from compressed gases.
 - e. Vapors - Evaporation from solvents or paints.
4. Air contaminants may be heavier than air, lighter than air, displace oxygen, or may be toxic.

B. ENGINEERING CONTROLS

1. Engineering controls are often used in industry to remove or dilute air contaminants. Common engineering controls used by the Navy are:
 - a. Local exhaust ventilation - Exhaust vents near the contamination source to quickly remove the hazard.
 - b. Dilution ventilation - Adds fresh, clean air to dilute the concentration of the hazard to safe levels.
 - c. Enclosure - Keeps the air hazard within a booth or contained to protect workers.
 - d. Isolation - Places a hazardous process far from the workers.
 - e. Substitution - Using a less hazardous material or process.
2. Until engineering controls are in place, or if there is no control available, the protection must be applied to the INDIVIDUAL instead of the process. Respiratory protection is only used when no other method adequately protects the worker from health hazardous air contaminants.

SHOW VIDEOTAPE "SHIPBOARD RESPIRATORY PROTECTION FOR THE USER," IF AVAILABLE.

C. THE NAVY RESPIRATORY PROTECTION PROGRAM

1. Respiratory protection programs are regulated by OSHA, and those regulations are applied to the Navy's program. Each program aboard ship must contain the following elements:

DISTRIBUTE HANDOUT #1

- a. Written standard operating procedure.
- b. Selection of the proper respirator for the job.
- c. Training for users and supervisors.
- d. Fit-testing respirator masks.

- e. Inspection and maintenance of respirators.
 - f. Cleaning and disinfection of respirators.
 - g. Proper storage of respirators.
 - h. Use of only National Institute of Occupational Safety and Health (NIOSH) and Mine Safety and Health Administration (MSHA) approved respirators.
 - i. Medical screening of respirator users.
 - j. Periodic program evaluation and monitoring.
 - k. Surveys to determine operations requiring the use of respirators.
2. The command respiratory protection program must comply with all of the above elements. The Commanding Officer designates a Respiratory Protection Officer (RPO) to oversee the program.
- a. The Respiratory Protection Officer -
 - (1) Monitors and evaluates the program.
 - (2) Ensures training is conducted.
 - (3) Writes and reviews the operating procedures.
 - (4) Provides guidance on respirator stocking and selection.
 - (5) Ensures fit-testing is conducted.
 - b. The Medical Department Representative (MDR) screens and medically qualifies each respirator user. This becomes part of the user's medical record.
 - c. The Safety Officer and Divisional Safety Petty Officers train and monitor respirator users.
 - d. Division Officers and Work Center Supervisors ensure the proper types and adequate quantities of respirators are available to workers.
 - e. All respirator users are responsible for wearing only those respirators for which they have been fit-tested and qualified.

D. TYPES OF RESPIRATORS

1. Air-purifying respirators

- a. Remove air contaminants by filtering, adsorbing, or absorbing them as the air passes through the filter.
 - (1) Chemically absorbs contaminants in the air as gases and vapors pass through the filter.
 - (2) Physically captures the particle on the filter.
- b. Do not supply air. Adequate oxygen must be present in the area of respirator use or the user will suffocate.
- c. Available in quarter, half, or full facepiece styles.
- d. Either non-powered or powered.
 - (1) The non-powered type depends on the user's lungs to draw air through the purifying element during inhalation.
 - (2) The powered type is equipped with a battery which powers a fan forcing air through the element and keeps a positive pressure inside the mask.
- e. Obtained with replaceable cartridges, filter pads, or pre-filters. Some are available with built-in filter cartridges and the entire unit is disposable after use.
- f. Each cartridge is labeled with its use and approval number. (A MSHA/NIOSH approval number starts with "TC-".) Cartridges are also color coded.
 - (1) Each cartridge is designed to remove a specific gas, vapor, or type of particle. For example, there are cartridges to remove organic vapors, ammonia gas and metal fume particles.
 - (2) Filters and pre-filters can be in addition to a cartridge to capture spray mist and prevent the filter face from clogging.

- g. The same manufacturer must make all cartridges, filters, and facepieces for a respirator. Since NIOSH and MSHA approve respirators as a set, the parts from one manufacturer don't normally fit a respirator made by another manufacturer.
- h. Cartridges and filters can be used until the inner chemical or filter surface is exhausted.
 - (1) Some air contaminants have "warning properties." This means you can detect the material by smell, eye, or respiratory irritation. You can tell if the contaminant gets through the cartridge or mask.
 - (2) The length of time a cartridge lasts depends on:
 - (a) Concentration of the contaminant
 - (b) How heavily the user breathes
 - (c) Humidity in the air
 - (d) Other factors
 - (3) A cartridge is exhausted when you get "break-through." If the contaminant has good "warning properties," you can tell when the contaminant breaks-through. You should then change to a fresh cartridge.
 - (4) If the material has no "warning properties," and is highly toxic, you need to wear supplied air respiratory protection, as instructed by your supervisor. You couldn't tell, with an air-purifying respirator, when the cartridge was exhausted and could be exposed to the contaminant.

2. Air-supplying respirators

- a. Air supplying respirators are used when the contaminant has no warning properties (for example, it's odorless), when the concentration is too high for an air-purifying respirator, or the environment is Immediately Dangerous to Life or Health (IDLH).
- b. There are two types of air supplying respirators: airline and self-contained units.

- c. Airline masks supply breathing air from an Ambient Air Breathing Pump (AABP) or certified LP air source.
- (1) Ship's LP air must be tested quarterly and certified to meet "Grade D" Breathing Air Standards, if used for breathing air.
 - (2) The maximum length of hose you can use with an airline mask is 300 feet.
 - (3) The airline mask respirators are certified as a set from a manufacturer, so the same manufacturer must make all the parts of the respirator system.
 - (4) Airline masks can be:
 - (a) Demand type, which supplies air when the user inhales. This type can allow contaminant leakage into the mask, since there is a negative pressure in the mask.
 - (b) Pressure-demand type, which provide a continuous positive pressure, even when the user inhales. This prevents leakage around the mask and is the safest of the supplied air respirators.
 - (c) Continuous Flow, which provides a continuous flow of air into the mask to prevent contaminant leakage into the mask. This respirator is for emergency asbestos removal aboard ship.
 - (d) EAB or Emergency Breathing Apparatus used on submarines, which serves as a respirator when converted according to NAVSEA instructions.
- d. Self-contained Breathing Apparatus (SCBA) consists of a facepiece, hose, regulator, and source of air carried by the user.
- (1) Closed-circuit SCBA's use a chemical canister to remove exhaled CO₂; and, from either a tank or chemically, provide a small amount of oxygen.

- (2) Open-circuit SCBAs use bottled, compressed air, and exhaled air is expelled to the atmosphere. Open-circuit SCBAs are available with either a pressure-demand or demand regulator.
 - (3) EEBDs (Emergency Escape Breathing Devices) are a special type SCBA for emergency escape only. Never use them for entry into a hazardous atmosphere.
- e. In IDLH (Immediately Dangerous to Life or Health) atmospheres, only two types of respirators are authorized:
- (1) Full facepiece, self-contained breathing apparatus (SCBA) operated in a pressure-demand mode.
 - (2) A full facepiece airline respirator operated in the pressure-demand mode, with an auxiliary self-contained air supply containing at least a 15-minute air supply. The 15-minute auxiliary air is to ensure escape, if the airline respirator fails.
3. Surgical masks are not certified as respiratory protection and are never to be used in place of an approved respirator.
4. OBAs (Oxygen Breathing Apparatus) and MCU-2/P gas masks are emergency equipment only. They are not approved respirators and cannot be used as respirators.
- a. The use of an OBA to enter an IDLH atmosphere is only allowed if:
- (1) The ship is underway.
 - (2) Required by an emergency or operational necessity.
 - (3) Approved by the Commanding Officer.

E. MEDICAL QUALIFICATION

- 1. Before you may work using a respirator, you must be "medically qualified."

- a. Some people have medical problems which may not allow them to use a respirator. Lung problems, previous exposures to hazards, some medications or physical deformities may disqualify them from using a respirator.
- b. Corpsmen will do a medical evaluation to determine if you can wear a respirator, or if there should be limitations on your respirator use. The corpsmen may refer you to a physician for further evaluation if they identify possible medical problems.
- c. Once cleared by the Medical Department, you may be fitted and issued a respirator. The medical clearance becomes part of your medical record.

E. RESPIRATOR SELECTION

1. Evaluation of the Hazard

- a. The first step in respirator selection is evaluating the type hazard and if an air contaminant is present.
 - (1) This evaluation can be based on an Industrial Hygiene survey or the Safety Officer's or other trained supervisors estimate of the hazard.
 - (2) If the work procedure produces dust; for example, "Is the dust potentially toxic?" Dust from lead paint is much more of a hazard than sawdust, for instance. Different levels of protection would be required.
 - (3) Respirator protection is based on the potential health hazard and the amount of ventilation available.
 - (4) If in doubt, too much protection is better than too little.
- b. Key questions on evaluation of the hazard include:
 - (1) Can you smell the contaminant gas or vapor? How can you tell if the respirator leaks or fails, if the contaminant has no "warning properties?"
 - (2) Is the contaminant absorbed through the skin?

- (3) Is it "Immediately Dangerous to Life or Health" (IDLH)?
 - (4) What is the expected concentration of the gas or vapor in the air? High concentrations may use up the cartridge very quickly.
 - (5) Is there sufficient oxygen in the air?
2. Match the respirator to the hazard.
- a. Respiratory protection is specific for:
 - (1) Dusts
 - (2) Mists
 - (3) Fumes
 - (4) Vapors
 - (5) Gases
 - (6) Lack of oxygen
 - b. Select the respirator designed or rated for the specific type of protection.
 - c. All respirators used by the Navy must be NIOSH and MSHA approved. The manufacturer seeks this approval. They display the approval number on each respirator mask and cartridge (begins with "TC-").
 - d. Manufacturers produce their masks and cartridges so they are not interchangeable with any other manufacturer. For example, a cartridge made by Willson company will not fit into a mask made by North company.
3. Respirators are issued by trained personnel who are aware of correct selection.
- a. OPNAVINST 5100.19B, Appendix B6-E-4 provides a respirator selection guide to assist in picking the right respirator for the job.

IF AVAILABLE, SHOW STUDENTS AN EXAMPLE OF A DUST MASK, WELDING FUME MASK, AND ORGANIC VAPOR RESPIRATOR WITH AND WITHOUT PRE-FILTERS. INDICATE THE JOBS ON BOARD WHERE THEY WOULD USE EACH MASK

- b. Respirators are issued by _____
at _____.

EXPLAIN YOUR COMMAND'S RESPIRATOR ISSUE PROCEDURES.

F. RESPIRATOR FIT-TESTING

1. There are a variety of respirator models and styles, made to fit a variety of face shapes and sizes.
 - a. Half-facepiece respirators come in small, medium and large sizes.
 - b. Each respirator user must put on the mask they will use and be tested, to ensure the respirator fits.
 - c. Fit-testing is conducted by a trained individual and will verify that your respirator does not leak around the seal.
2. Qualitative fit-testing
 - a. On board ship, fit-testing is required for personnel assigned to use a respirator.
 - (1) The Respiratory Protection Officer will determine who needs to be fit-tested.
 - (2) "Qualitative fit-testing" uses an irritant smoke, pleasant smelling vapor, or sweet mist to test for leaks around the seal. The user, smelling the material, determines the "quality" of the test.
 - (3) "Quantitative fit-testing" is performed using a probe inserted in the respirator and sensing the contaminant, which is read out on a meter. It determines the quantity of contaminant passing through the mask seal. This type of fit testing may be required for asbestos and lead workers.
 - b. Fit-testing is performed by your Medical Department, a shore medical facility, or the local tender or repair ship Safety Officer.
 - c. When you are fit-tested, you will be instructed in how to properly wear the mask, how to get a good seal, and how to care for your respirator.

- d. You must be re-fitted for your respirator size annually. Asbestos and lead workers must be re-fitted semi-annually.
- e. When donning your correct size and model of respirator, always check for a good fit using the positive and negative pressure checks.
 - (1) Cover the exhalation valve and breath out to do the positive pressure check.
 - (2) Cover the inhalation valve or cartridges and inhale to do the negative pressure check.
 - (3) The mask should not leak around the seal for either check.

H. CARE OF YOUR RESPIRATOR

- 1. Reusable respirators with detachable cartridges must be cleaned and sanitized after every use.
 - a. Full facepiece airline masks and SCBA masks must also be cleaned and sanitized.
 - b. Each respirator must be cleaned, sanitized with a disinfectant, checked for missing parts, and stored in a zip-lock bag.
 - c. A dirty respirator can spread diseases. Missing parts can render the respirator useless.
 - d. The respirator issuer will conduct this cleaning when you return the mask. If you are permanently issued a mask, you are responsible for cleaning your own respirator.
- 2. PMS is available for airline hose masks and ambient air breathing pumps using MIP 6600.
- 3. Always keep your respirator in a clean plastic bag, away from heat or strong chemicals.
- 4. If using a disposable or maintenance-free respirator, dispose of the respirator after each use or clean and store it in a sealed plastic bag until you discard the mask.

SUMMARY:

When good ventilation cannot protect you from air contaminants, respiratory protection may be necessary. For proper protection, each respirator user must be medically qualified to use a respirator, fit-tested, trained, and issued the correct respirator. Respirators are designed to protect against specific air contaminants and must be selected to match the hazard. Your command provides you with the respiratory protection needed in your work. All hands must cooperate and correctly use required respiratory protection.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.19B CHAPTER B6.

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY. QUIZ KEY IS ALSO PROVIDED.

RESPIRATORY PROTECTION PROGRAM

In accordance with OPNAVINST 5100.19B, NAVOSH Program Manual for Forces Afloat, and OSHA regulations, every respiratory protection program must contain all the following elements:

1. WRITTEN STANDARD OPERATING PROCEDURES FOR A RESPIRATORY PROTECTION PROGRAM.
2. PROPER, HAZARD-SPECIFIC SELECTION OF RESPIRATORS.
3. USER AND SUPERVISOR TRAINING ON RESPIRATORS.
4. FIT-TESTING OF ALL RESPIRATOR USERS.
5. INSPECTION AND MAINTENANCE OF RESPIRATORS.
6. CLEANING AND DISINFECTION OF RESPIRATORS.
7. CONVENIENT, CLEAN AND SANITARY STORAGE OF RESPIRATORS.
8. USE OF ONLY NIOSH AND MSHA APPROVED RESPIRATORS.
9. MEDICAL SCREENING OF ALL RESPIRATOR USERS.
10. PERIODIC MONITORING AND EVALUATION OF THE PROGRAM.
11. INDUSTRIAL HYGIENE SURVEYS TO IDENTIFY OPERATIONS REQUIRING RESPIRATORS AND THE TYPES OF RESPIRATOR RECOMMENDED.

THE COMMAND RESPIRATORY PROTECTION OFFICER (RPO) IS _____

RESPIRATORY PROTECTION PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER

1. You only need to wear a respirator if you can see or smell the air contaminant.
 - A. True
 - B. false
2. Scientific measurements are used to determine your exposure level to hazards in the air.
 - A. True
 - B. False
3. Air purifying respirators:
 - A. Supply air
 - B. Are always made of white paper
 - C. Only protect against gases
 - D. Remove vapors or particles from the air as you inhale
 - E. None of the above
4. A respirator's approval and use will be printed right on the mask or cartridge.
 - A. True
 - B. false
5. Medical qualification to use a respirator is not required if you only use a respirator a few days a year.
 - A. True
 - B. False
6. Air supplying respirators:
 - A. Provide air in bottles
 - B. Provide air from certified compressors
 - C. Provide air from air pumps
 - D. All of the above

7. If you can smell the paint while using a respirator, you should:
- A. Tell your supervisor immediately.
 - B. Take it off and keep painting.
 - C. Borrow a friend's respirator.
 - D. Take a break until the air clears.
 - E. Place a wet rag over the respirator.
8. A fume is:
- A. Given off by acid and paint.
 - B. Evaporated liquid.
 - C. Particles from welding operations.
 - D. The same as a vapor.
 - E. Invisible.
9. You must be fit-tested for your respirator:
- A. When you enter the Navy and never again.
 - B. At least annually.
 - C. Before each use.
 - D. Whenever the cartridges are changed.
 - E. None of the above.
10. An organic vapor respirator can be used as protection for:
- A. Chipping paint
 - B. Brush painting
 - C. Sawdust sanding
 - D. Welding
 - E. Grinding

RESPIRATORY PROTECTION QUIZ KEY

1. B
2. A
3. D
4. A
5. B
6. D
7. A
8. C
9. B
10. B

#8

SON TOPIC: ELECTRICAL SAFETY AND TAG-OUT PROGRAM

RAGE TIME: One Hour (Section I), 30 minutes (Section II)
(add 15 minutes for each videotape shown)
(add time for CPR lecture, if given)

TRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B7
- b. OPNAVINST 3120.32B
- c. NSTM, Chapter 300
- d. TYCOM and ship's electrical safety directives

TRAINING AIDS:

- a. Videotape: "Electrical Safety" (805008-DN)
"Shipboard Tag-Out Procedures" (805081-DN)
- b. Handout #1 - Tool Issue Request form
- c. Handout #2 - Authorization for Personal Electrical/
Electronic Equipment
- d. Handout #3 - Prohibited personal electrical items
- e. Samples of red and yellow tags and tag-out log
- f. Handout #4 - Electrical Shock First Aid and CPR
- g. Quiz

ECTIVE;

The student should understand the dangers of electrical
ck, the ungrounded shipboard electrical system, and first aid
electrical shock. The student should be familiar with the
p's procedures for issuing electrical tools and authorizing
use of personal electrical and electronic equipment onboard.
student should also understand the purpose of the tag-out
gram and be able to recognize the various tags.

GET AUDIENCE:

All hands, including supervisory personnel.

UIREMENT:

Initial and annual training for all personnel in accordance
h OPNAVINST 5100.19B.

I. INTRODUCTION- ELECTRICAL SAFETY PROGRAM

The purpose of electrical safety is to minimize the risk of electrical shock through awareness of electrical hazards. Aboard ship, the potential for electrical shock is high due to the presence of metal, high humidity, salt water, and high voltage equipment. Electrical shock fatalities continue to occur aboard ship. Personnel must be familiar with electrical safety precautions, rescue, and first aid techniques.

A. BACKGROUND

1. Shipboard electrical system

- a. Ships have an "ungrounded" electrical system. This means there are no permanent, low resistance connections between the power system and the structure of the ship.
- b. This "ungrounded" system is critical to achieve maximum reliability and continuity of electrical power under combat conditions. Both lines to a two-pronged plug are "hot," unlike ashore where one prong is "hot" and the other is "neutral." In battle, should one line be damaged, power would be maintained to vital systems. If designed as a grounded system, damage to one line would trip a circuit protective device (circuit breaker or fuse) and de-energize vital equipment.
- c. With a wet, metal environment surrounding the worker, the risks of electrical shock are much higher than work ashore. Special precautions and procedures are required aboard ship.

2. The Navy's shipboard electrical safety program:

- a. The Navy's program was developed to deal with the increasing amount of electrical and electronic equipment installed aboard ship.
- b. The program elements consist of:
 - (1) Proper installation, maintenance, and repair of electrical equipment.
 - (2) Routine and periodic testing to detect and correct unsafe equipment.
 - (3) Portable electrical tool issue procedures.

- (4) Training all hands in electrical safety.
- (5) Proper use of equipment tag-out procedures.
- (6) Control and safety testing of personal electrical and electronic equipment.

3. Equipment classification

- a. Electrical devices usually don't have any solid state components. They fall into three categories:

- (1) Portable electrical equipment - Examples: drills, buffers, hair clippers, drop lights, deck crawlers, and sanders.

- (a) This equipment is hand held while energized.

- (2) Mobile electrical equipment - Examples: typewriters, lamps, and adding machines.

- (a) This equipment is stationary while energized, but not hardwired.

- (b) The equipment is normally energized more than 50% of the time.

- (3) Stationary or installed electrical equipment.

- (a) This equipment is hardwired into the ship's electrical system.

- b. Electronic equipment contains solid state components, transformers, capacitors, or circuit boards, such as radios, televisions, computers, combat systems equipment and radars. They can be portable, mobile, or stationary.

- c. The classification of portable, mobile, or stationary determines the periodicity of PMS electrical safety checks.

B. COMMAND RESPONSIBILITIES

1. Chain of command

- a. The Commanding Officer has overall responsibility for the Electrical and Electronic Safety Program.

GIVE NAMES OF ASSIGNED OFFICERS FOR YOUR COMMAND.

- b. An Electrical Safety Officer and Electronics Safety Officer is appointed in writing by the Commanding Officer.
 - c. The Electrical Safety Officer oversees the ship's electrical tool issue program and personal equipment electrical safety checks.
 - d. Department Heads and Division Officers ensure their personnel comply with the program.
 - e. All hands are ultimately responsible for compliance.
2. Each command must write and issue an electrical safety program and tool issue instruction. The instruction:
- a. Provides regulations specific to the command, especially on the set-up of the ship's tool issue program.
 - b. Provides forms used to check out tools, document training, and to authorize using personal gear onboard.
 - c. Lists prohibited electrical and electronic equipment.
 - d. Lists electrical and electronic training requirements.

SHOW THE VIDEOTAPE "ELECTRICAL SAFETY," IF AVAILABLE.

C. COMMAND TOOL ISSUE PROCEDURES

1. Electrical portable tools
- a. Personnel throughout the ship may, at times, need to check-out and use portable electrical tools, such as drills, vacuum cleaners, sanders, grinders, portable lights and extension cords.
 - b. These items are controlled and issued only to personnel who have been trained in electrical safety.
 - c. Before issue, the designated tool issue room custodian performs PMS on that item and does an electrical safety check.

- d. Those who wish to check-out an electrical item must complete a tool issue request (HANDOUT #1).
- e. The custodian checks to ensure the requestor attended annual electrical safety training.
- f. The custodian also issues any required protective equipment to safely use the tool. Examples include: hearing, eye, and respiratory protection; electrical safety rubber gloves and leather gloves that fit over the rubber gloves.
- g. The tool can only be checked out for use one day unless the Division Officer approves check-out overnight.

2. Electrical tools held by workcenters

- a. Some division or work centers are authorized to permanently retain electrical equipment.
- b. These tools also require electrical safety checks.

3. Electrical safety rubber gloves

- a. Special rubber gloves are available which provide insulating protection against certain voltages. Electrical safety rubber gloves provide an insulator between your hands and the electrical equipment.
- b. Leather outer shells may be used to keep the rubber gloves from tearing.
- c. PMS is required on the gloves before every use.
- d. Never use the electrical gloves to handle dry chemicals, solvents, or other hazardous materials. The materials will deteriorate the rubber and reduce their electrical shock protection value.
- e. Never use chemical protection gloves for electrical shock protection. They are labeled on the cuff saying they are not meant for electrical work.

EXPLAIN SPECIFIC PROCEDURES FOR YOUR COMMAND'S TOOL ISSUE PROGRAM. INCLUDE THE LOCATION OF TOOL ISSUE ROOM AND THE HOURS OF OPERATION.

D. GENERAL ELECTRICAL SAFETY PRECAUTIONS

1. Electrical equipment repair and PMS
 - a. Only qualified and authorized personnel may perform PMS or repair electrical or electronic equipment.
 - b. Unauthorized personnel should never try to change fuses.
 - c. Personnel should never try to repair, rewire or "jury-rig" any electrical equipment.
2. Personnel should obey all warning signs, tags and read operating procedures BEFORE using electrical equipment.
3. Personnel must never work on energized electrical equipment without the commanding officer's permission.
4. Personnel must never remove any red (DANGER) or yellow (CAUTION) tags, or energize equipment having those tags unless they read and comply with the instructions listed on the back of the tag.
5. Personal electrical and electronic equipment
 - a. All personally owned equipment brought aboard ship must be authorized and electrically safety checked.
 - b. This form (HANDOUT #2) must be used to request authorization and electrical safety checks. Safety checks are performed at _____.

GIVE OUT HANDOUT #2 AND EXPLAIN PROCEDURE. GIVE LOCATIONS WHERE ELECTRICAL AND ELECTRONIC SAFETY CHECKS ON PERSONAL GEAR ARE PERFORMED.

- c. Some items are prohibited for personal use on board ship (HANDOUT #3- READ AND EXPLAIN)
- d. Electrical safety checks on personal electrical and electronic equipment are required every six months. If the cord is detachable, both the equipment and the cord (or recharger) require a safety check and tag.

E. ELECTRIC SHOCK FIRST AID AND CPR

1. Electric shocks can range from a slight tingle to immediate death.

- a. Everyone, especially those people who work around electrical equipment and electronic systems, should know the rescue and first aid procedures for electric shock.
- b. To rescue personnel in contact with energized circuits:
 - (1) Do not try to administer first aid or touch an electrical shock victim before cutting off the voltage. Shut off the voltage as soon as possible.
 - (2) If you cannot turn off the voltage immediately, do not touch the victim until removing them from the live conductor.
 - (3) To remove a victim from a live circuit, use a dry board, belt, dry clothing, or other non-conductive material to free the victim. DO NOT TOUCH THE VICTIM until they are free of the live circuit.
 - (4) Call for medical assistance and administer first aid and artificial respiration. Do not attempt Cardiopulmonary Resuscitation (CPR) unless you have been trained.

PROVIDE HANDOUT #4 - ELECTRIC SHOCK FIRST AID AND CPR.

- (5) All electrical and electronic-related ratings must receive CPR training. All crew members should be familiar with electric shock first aid.

MEDICAL DEPARTMENT REPRESENTATIVE SHOULD PROVIDE CPR, ELECTRICAL SHOCK TRAUMA AND FIRST AID TRAINING TO COMPLETE THIS LECTURE. USE SECTION 300-2.86 OF NSTM, CHAPTER 300, CHANGE 8, AND AMERICAN RED CROSS OR AMERICAN HEART ASSOCIATION CPR TRAINING PROCEDURES.

F. SUMMARY

Electrical shock is a very real hazard. On board ship, the combination of high humidity, metal structures, high voltage electricity, and perspiration combine to ensure the potential for electrical shock exists all the time. The purpose of the Navy's electrical safety program and safety precautions is to prevent mishaps which could cause fatalities, injuries, and extensive damage to shipboard equipment.

FOR MORE DETAILED INFORMATION SEE OPNAVINST 5100.19B CHAPTER B7 ON ELECTRICAL SAFETY AND NSTM, CHAPTER 300.

HANDOUT # 1

REPRODUCE THE TOOL ISSUE REQUEST FORM FROM YOUR SHIP'S
ELECTRICAL SAFETY INSTRUCTION OR FROM YOUR TYPE COMMANDER'S
ELECTRICAL SAFETY DIRECTIVE

HANDOUT #2

REPRODUCE THE PERSONAL ELECTRICAL/ELECTRONIC EQUIPMENT
AUTHORIZATION REQUEST FROM YOUR SHIP'S ELECTRICAL
SAFETY INSTRUCTION OR USE APPENDIX B7-B IN OPNAVINST
5100.19B)

HANDOUT #3

PROHIBITED PERSONAL ELECTRICAL EQUIPMENT

From NSTM, Chapter 300, Section 300-2.70

Personally owned or non-Navy-standard equipment listed below are prohibited from being introduced and used aboard ship. Adequate government owned equipment is provided to meet the needs associated with these items. Non-Navy-standard items, of the types listed below, are generally a shock hazard because of inferior insulation, leakage currents, and flimsy structure.

- FANS
- PORTABLE EXTENSION CORDS
- HI-INTENSITY LAMPS
- READING LAMPS
- ELECTRIC BLANKETS
- HEATING PADS
- ELECTRIC POWER DRIVEN TOOLS (except for those specifically used as hobby tools is safety checked)
- HEAT/SUN LAMPS
- HOT PLATES
- GRIDDLES
- ELECTRIC CLOCKS (unless approved by the Electrical Officer)
- MICROWAVE OVENS
- PORTABLE EXTENSION LIGHTS
- ELECTRIC HEATERS
- PORTABLE REFRIGERATORS
- PORTABLE AIR CONDITIONERS
- IMMERSION-TYPE WATER HEATERS

ELECTRICAL SHOCK FIRST AID AND CPR

RESCUE AND FIRST AID

1. Do not administer first aid or touch an electrical shock victim until after you turn off the power. Shut off the voltage as soon as you can.
2. If you cannot turn off the voltage immediately, do not touch the victim until removing them from the live conductor.
3. To remove a victim from a live circuit, use a dry board, belt, dry clothing, or other non-conductive material to free the victim. DO NOT TOUCH THE VICTIM until they are free of the live circuit.
4. Call for medical assistance and administer first aid and artificial respiration.
 - a. Do not move the victim.
 - b. If conscious, keep the victim calm.
 - c. Treat any bleeding with a clean compress.
 - d. If unconscious, check for breathing and heartbeat.
 - e. If the victim is not breathing, IMMEDIATELY start mouth-to-mouth artificial respiration to aid a victim of electric shock, after removing them from contact with the electrical power.
 - f. If you can't feel the victim's pulse at the wrist or neck, apply cardiac compressions immediately. Severe brain damage starts occurring in four minutes unless circulation is re-established.

CARDIOPULMONARY RESUSCITATION (CPR)

NOTE: Do not attempt Cardiopulmonary Resuscitation (CPR) unless you have been trained.

1. If you find someone has collapsed, first determine if they are conscious by shaking their shoulder and shouting, "ARE YOU ALL RIGHT?" If you get no response, shout for help.

2. If the victim is not lying flat on the back, roll them over, moving the entire body at one time as a total unit. Then open the airway.
3. To open the victim's airway, use the head tilt/chin lift method. Kneel beside the victim's shoulder; lift the chin up gently with one hand while pushing down on the forehead with the other to tilt the head back. Lift the chin so the teeth are almost together. Avoid completely closing the mouth.
4. Once the airway is open, place your ear close to the victim's mouth.
 - a. Look for the chest to rise and fall.
 - b. Listen for sound of breathing.
 - c. Feel for air coming from the victim's nose and mouth.
 - d. If none of the signs are present, the victim is not breathing.
 - e. If opening the airway does not cause the victim to begin breathing spontaneously, you must provide artificial respiration.
5. The best way to provide artificial respiration is using the mouth-to-mouth method.
 - a. Using your hand on the victim's forehead, turn it so can pinch the victim's nose shut with your thumb and index finger while maintaining backward pressure on the forehead.
 - b. Open your mouth wide. Take a deep breath. Seal your lips around the outside of the victim's mouth. Give two full breaths into the victim's mouth at the rate of one- to one-and-one-half seconds per breath. Completely refill your lungs after each breath.
 - c. Watch for the victim's chest to rise when you breath into the victim. Allow the victims lungs to deflate between breaths. Watch for the victim's chest to fall after you remove your mouth.
 - d. After giving two full breaths, feel for a pulse at the side of the victim's neck to see if their heart

is beating. If you cannot feel the pulse, you shall provide artificial circulation in addition to rescue breathing.

6. Artificial circulation is provided by external cardiac compression (pressing on the heart).
 - a. Kneel at the victim's side near the chest.
 - b. Locate the notch at the lowest portion of the sternum and place the heel of one hand on the sternum one-and-one-half to two-inches above the notch.
 - c. Place your other hand on top of the first one. Be sure to keep your fingers off the chest wall. You may interlock your fingers.
 - d. Bring your shoulders directly over the victim's sternum as you compress downward, keeping your arms straight.
 - e. Depress the sternum about one-and-one-half to two-inches for an adult. Then relax pressure on the sternum completely. Do not remove your hands.
 - f. Relaxation and compression should be of equal duration.
7. If you are the only rescuer, you must provide both rescue breathing and cardiac compression. The proper ratio is 15 chest compressions to two full breaths. You must compress at the rate of 80 - 100 times per minute when you are working alone, since you will stop compressions when you take time to breathe.

REMEMBER

1. Is the victim unconscious?
2. If so, shout for help, open the airway and check for breathing.
3. If there is no breathing, give two full breaths.
4. Check carotid pulse.
5. Send someone to call away a medical emergency.
6. If no pulse is felt, begin external cardiac compression.
7. Continue CPR until medical help arrives.

II. INTRODUCTION - TAG-OUT PROGRAM

In order to prevent injury to personnel and damage to equipment, a tag-out program is mandatory for all shipboard equipments, components, and systems. The program is designed to notify personnel, by the use of colored tags, the equipment or systems not in their normal operating condition. To tag out equipment in civilian industry, workers use locks to "lock-out" personnel from controllers and switches. The Navy uses red or yellow tags to warning others that energizing or using the tagged out equipment could cause a mishap. Tag-out procedures may apply, for example, to electrical work, diving operations, working aloft operations and corrective maintenance.

A. BACKGROUND

1. The purpose of tag-out procedures

- a. Provide a method of preventing the operation of a component, equipment, system or portion of a system when isolated or in an abnormal condition.
- b. Tags may be applied to valves, switches, or other operating devices to indicate the restrictions.
- c. The tags may be used to indicate equipment status, if the equipment is unreliable, or is in an abnormal condition. For example, the operator must energize an override before emergency operation while waiting for the correct part for repair.
- d. PMS Maintenance Requirement Cards may indicate tag-out requirements and are part of the maintenance action.

2. Equipment Tag-out Bill

- a. OPNAVINST 3120.32B (SORM) standardizes tag-out procedures.
- b. Each ship must have a command tag-out bill or instruction and carefully comply with all parts of the directive.
- c. The Tag-Out Program consists of:
 - (1) Establishes a Tag-out Log.
 - (2) Assigns the Authorizing Officer.

- (3) Designates the use of tags, labels and forms.
- (4) Requires program audits and checks.
- (5) Requires the training of all hands and tag-out program users.

INTRODUCE AND SHOW VIDEOTAPE "SHIPBOARD TAG-OUT PROCEDURES,"
IF AVAILABLE)

B. RESPONSIBILITIES

1. The chain of command, from the Commanding Officer to the deckplate sailor, must support and comply with the tag-out program.
2. The Commanding Officer designates the Authorizing Officer by billet or watchstation to sign and clear tags and supervise the Tag-Out Log. The Authorizing Officer:
 - a. Must be qualified and trained in the tag-out program and procedures.
 - b. Ensures people assigned to make a tag-out are qualified and knowledgeable.
3. Even when a ship is in industrial availability, or being repaired by someone other than ship's force, the command is still responsible for all tag-out actions. To ensure equipment Danger tags are correctly installed, and cleared, there are provisions on the Tag-Out Record sheet and the Danger tag for signature by a repair facility representative.

C. TYPES OF TAGS

SHOW SAMPLES OF THE VARIOUS TAGS AND LABELS.

1. "DANGER" tag
 - a. A red tag with a string attached to tie the tag to the equipment.
 - b. Prohibits operation of equipment that could jeopardize safety of personnel or damage equipment.
 - c. Under no circumstances will anyone operate equipment or remove the tag except when authorized by appropriate, assigned individuals.

2. "CAUTION" tag

- a. A yellow tag with a string attached to tie the tag to the equipment.
- b. Precautionary tag used to provide temporary, special instruction, or to indicate the type of precaution which must be exercised to operate the equipment.
- c. Not used if personnel or equipment can be endangered while performing evolutions using normal operating procedures. That case requires a "danger" tag.

3. "OUT OF CALIBRATION" label

- a. An orange, peel and stick label.
- b. Indicates the instrument is out of calibration and is inaccurate.
- c. Indicates the instrument may be used only with extreme caution.
- d. The label may also indicate the correction necessary to get a proper reading.

4. "OUT OF COMMISSION" label

- a. A red, peel and stick label.
- b. Used to identify instruments that will not correctly indicate parameters because they are defective or are isolated from the system.
- c. Indicates the instrument cannot be relied on and must be repaired, reconnected, or recalibrated.

GIVE EXAMPLES OF WHERE THESE TAGS MAY BE SEEN OR USED.

C. GENERAL TAG-OUT RULES

1. All hands

- a. Only authorized and qualified personnel shall sign, hang, or remove any tag.

- b. Personnel shall never operate or energize any tagged-out equipment, component, or system unless authorized by the Commanding Officer (DANGER tag), or unless they read and comply with instructions on the tag (CAUTION tag).
- c. Personnel shall report to their supervisor any equipment which may, if energized or operated, cause an injury or material damage, and should be considered for tag-out.

2. Authorized personnel

- a. Any personnel designated to prepare or remove tags shall receive detailed training in the command's tag-out procedures.
- b. Designated personnel shall demonstrate their thorough knowledge of tag-out procedures, use of the tag-out log, and the procedures for clearing tags.
- c. This detailed training shall be accomplished annually.

SUMMARY:

The tag-out program is used aboard ship to protect people and equipment. All hands must recognize the importance of these tags, know the purpose of these tags, and understand the results of not complying with tag-out procedures. Serious injuries or fatalities can result when people don't follow tag-out procedures. People directly involved in placing and removing tags will receive detailed training, but all crew members must be aware of this program and recognize the various tags.

FOR ADDITIONAL INFORMATION, CONSULT OPNAVINST 3120.32B-SORM SECTION 630.17.

ADMINISTER 10 QUESTION QUIZ, WHICH INCLUDES BOTH ELECTRICAL SAFETY AND TAG-OUT QUESTIONS.)

ELECTRICAL SAFETY PROGRAM/TAG-OUT PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. The electrical systems aboard ship are:
 - A. All 440 volt.
 - B. Ungrounded systems.
 - C. Grounded systems.
 - D. No different from ashore.
 - E. All high voltage.
2. In the tag-out program a yellow tag means:
 - A. DANGER.
 - B. The equipment requires calibration before use.
 - C. There are people working aloft.
 - D. CAUTION.
 - E. Out of commission equipment.
3. Anyone conducting PMS is allowed to place a DANGER tag on equipment.
 - A. True
 - B. False
4. Which of the following personally-owned items cannot be used aboard ship?
 - A. Razor
 - B. Hair Dryer
 - C. Battery-operated fan
 - D. Typewriter
 - E. Electric alarm clock
5. Electric equipment is classified as portable if:
 - A. It is hard-wired into the ships electrical system.
 - B. It is secured for sea.
 - C. It is held in your hand while operating.
 - D. It can be moved by two or more people.
 - E. It has a plastic case.
6. Every command must appoint an Electrical Safety Officer.
 - A. True
 - B. False

7. If you have not had annual electrical safety training you may not check-out an electrical tool.

- A. True
- B. False

8. When electrical safety rubber gloves get old, you can use them for cleaning.

- A. True
- B. False

9. All personal electrical and electronic equipment must be safety checked:

- A. Only when first brought on board.
- B. Once a year.
- C. Every 6 months.
- D. Every two years.

10. To be allowed to prepare or remove tags, the person must:

- A. Be designated by the command.
- B. Demonstrate their knowledge of tag-out procedures.
- C. Be trained in tag-out procedures.
- D. All of the above.

ELECTRICAL SAFETY/TAG-OUT QUIZ KEY:

1. B
2. D
3. B
4. E
5. C
6. A
7. A
8. B
9. C
10. D

LG #9

LESSON TOPIC: ASBESTOS HAZARDS AND EXPOSURE CONTROL

AVERAGE TIME: 30 minutes (add 30 minutes for donning protective clothing demonstration and 18 minutes for the videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B1
- b. NSTM, Chapter 635

TRAINING AIDS:

- a. Videotape: Asbestos At The Worksite (68164 DN)
- b. Examples of asbestos hazard signs
- c. Asbestos removal protective equipment
- d. Handout #1- Medical Surveillance Questionnaire
- e. Quiz

OBJECTIVES:

The student should be able to identify the health hazards associated with asbestos exposure, be aware asbestos may be present on many Navy ships, and there are special precautions required when dealing with asbestos. Students should understand the Navy's asbestos exposure control program and demonstrate the use of asbestos personal protective equipment.

TARGET AUDIENCE:

All personnel and supervisors who may come into contact with asbestos or may be designated as emergency asbestos removal team members. This lecture should also be presented to all personnel working in areas where asbestos is known to be present (engineering personnel and elevator maintenance workers)

REQUIREMENT:

Initial and annual refresher for asbestos workers or personnel at risk of exposure, in accordance with OPNAVINST 5100.19B.

INTRODUCTION

Though Navy no longer builds ships using asbestos thermal material, many older ships still contain great quantities of material. This material has been used for lagging in engine rooms, as floor tile, gasket materials, and pipes. If inhaled, the dust created during asbestos removal when disturbing asbestos insulation, can be hazardous. The Navy's asbestos exposure control program has been designed to prevent any future exposures to dangerous asbestos, and to regularly follow people with previous or current asbestos exposure who meet the NAVOSH criteria for inclusion in a surveillance program.

A. BACKGROUND

1. Asbestos in history

- a. Asbestos is a naturally occurring mineral, mined like coal, from the ground.
- b. Asbestos is fire and acid resistant, and since it occurs as a fibrous mineral, can be woven into cloth or add strength to things like pottery.
- c. Asbestos has been used for thousands of years, and was used extensively in this country until the 1970's.
- d. The link of asbestos with serious diseases lead to OSHA setting strict limits on asbestos dust exposure.

2. Health hazards

- a. Asbestos fibers break off into very small particles of dust. These particles are small enough that, when in the air, can be breathed deep into the lungs.
- b. Once deep in the lungs, the fibers can cause scar tissue or tumors.
- c. Asbestos dust exposure has been linked with diseases such as asbestosis, lung cancer and mesothelioma, a rare cancer of the chest and abdominal lining.
- d. These asbestos diseases may not show up for 15 or more years after exposure.

- e. Most cases of lung cancer in workers exposed to asbestos occur among workers who also smoke. Workers who smoke, and are exposed to asbestos, have chances 90 times greater of contracting cancer.

B. THE NAVY ASBESTOS EXPOSURE CONTROL PROGRAM

- 1. To comply with OSHA regulations, and prevent any Navy personnel from being exposed to asbestos, an asbestos exposure control program was developed as part of NAVOSH.
 - a. The program consists of:
 - (1) Identifying asbestos hazards.
 - (2) Controlling asbestos in the work environment.
 - (3) Adhering to strict work practices.
 - (4) Properly disposing of asbestos waste.
 - (5) Establishing an Asbestos Medical Surveillance Program (AMSP).
 - (6) Protecting the environment.
 - (7) Training people to recognize asbestos hazards and observe necessary precautions.
 - b. OPNAVINST 5100.19B sets down program policy and management requirements. NSTM, Chapter 635 provides asbestos handling procedures.
 - c. The purpose of the program is to protect personnel who, through their job or in emergency situations, come into contact with asbestos. If they must handle asbestos, we must ensure they have the proper protection and training.
 - d. For personnel who may have been exposed during their active duty service, before all the regulations were implemented, the Navy follows their health through medical surveillance.

C. IDENTIFICATION OF ASBESTOS

- 1. Asbestos has been used extensively on older (built prior to 1976) ships and submarines. Over the years some of this asbestos has been replaced with non-asbestos material.

2. The only way to determine if material contains asbestos is to test the material with a microscope.
3. Every tender and repair ship, and most shore medical facilities, have the microscopes and can analyze suspected material.
4. Unless obviously yellow or pink fibrous glass, black rubber insulation, or labeled non-asbestos lagging pads, we must assume the lagging in older ships is dangerous.
5. NSTM, Chapter 635 has a list of ships which are considered asbestos-free, and lists any places asbestos material may have been installed.
6. If in doubt, insulation should be considered hazardous

C. CONTROL OF ASBESTOS EXPOSURES

1. Personnel aboard ship are not authorized to remove or handle asbestos material, except in an emergency when authorized by the Commanding Officer.
 - a. Only IMA, tender, and SIMA lagging teams are allowed to handle or rip-out asbestos.
 - b. Civilian contractors and shipyards are also authorized to handle asbestos.
 - c. They have the training and proper equipment to safely deal with asbestos hazards.
2. Aboard ship, anyone seeing a potential asbestos hazard (open or torn lagging) should report the hazard to the Chief Engineer or Safety Officer immediately.
 - a. Never try to handle, remove, or repair suspected asbestos material without permission and special protective equipment.
 - b. Each ship having asbestos on board is required to have a trained, 3-person asbestos rip-out team for emergencies.
 - c. Never remove any lagging or disturb any insulation unless you have permission, and it has been confirmed the material is asbestos-free.

3. Strict work practices and protective equipment is discussed in NSTM, Chapter 635. The videotape, "Asbestos At The Worksite" demonstrates asbestos work practices and protection.

SHOW VIDEOTAPE "ASBESTOS AT THE WORKSITE". EXPLAIN THAT EVEN STRICTER LIMITS HAVE BEEN PLACED ON ASBESTOS EXPOSURES, AND THE PAPER-LIKE DUST MASKS ARE NO LONGER AUTHORIZED FOR ANY ASBESTOS WORK.

D. ASBESTOS MEDICAL SURVEILLANCE PROGRAM (AMSP)

1. The danger of asbestos is the asbestos dust.
 - a. In the lungs, tiny asbestos fibers can cause diseases such as asbestosis, lung cancer and rare mesothelioma.
 - b. The lungs are called the "target organ."
 - c. Medical examinations for asbestos illnesses concentrate on problems with the lungs.
2. Medical surveillance is medical tracking, to follow individuals exposed to certain hazards to see if symptoms appear, or if abnormalities are observed on the tests.
 - a. Medical surveillance is done on personnel previously exposed to asbestos fibers, and those currently assigned to asbestos removal teams.
 - (1) Everyone completes a surveillance questionnaire when reporting on board.

PROVIDE HANDOUT #1 - MEDICAL SURVEILLANCE QUESTIONNAIRE

- (2) If they were previously exposed to asbestos, the Medical Department will evaluate them to determine if they should be placed in the AMSP.
- b. People assigned as asbestos workers are given a pre-placement physical exam to make sure they have no previous exposures or health problems which could be aggravated by exposure to asbestos.
 - (1) All assigned asbestos workers and rip-out team members are placed in AMSP.

(2) These workers receive annual physical examinations.

c. Individuals placed in the AMSP receive medical evaluations, chest X-rays, and pulmonary function tests. The frequency of these tests depends on the individual's age and exposure history.

E. PERSONAL PROTECTIVE EQUIPMENT

1. Special full-body protection is required to work with asbestos.

a. The most important piece of protective equipment is the respiratory protection.

b. NSTM, Chapter 635 tells how to use each piece of equipment required. AEL 2-3300224045 lists the equipment:

(1) TYVEK or impervious disposable coveralls.

(2) Reusable cloth coveralls.

(3) Booties and head covering.

(4) Disposable plastic gloves over cloth gloves.

(5) Vortex cooling tube inside the coveralls.

(6) Goggles or safety glasses.

(7) Tape around all openings in the suit.

(8) Continuous flow, Type-C airline respirator.

(9) High Efficiency Particulate Air Filtering (HEPA) respirator (low levels of asbestos)

(10) Removal equipment, such as cast cutter, asbestos HEPA vacuum cleaner, water spray bottle, drop cloths, tape, warning signs, disposal bags, and breathing air pump.

FOR THOSE STUDENTS ON THE EMERGENCY TEAM GETTING REFRESHER TRAINING, SHOW AND DEMONSTRATE EACH PIECE OF EQUIPMENT. HAVE TWO STUDENTS DRESS OUT A THIRD MEMBER IN ALL REQUIRED PROTECTIVE EQUIPMENT. REVIEW NSTM, CHAPTER 635 WITH TEAM MEMBERS.

SUMMARY:

Asbestos is still present on many ships. Any ship having asbestos insulation is required to have a three-person emergency rip-out team. This team must be trained, be on medical surveillance, and be equipped with special protective clothing and equipment. Personnel working with brake linings and gasket material should also take precautions against asbestos exposure. Asbestos fibers can cause serious, sometimes fatal, occupational illnesses. The Navy has developed the asbestos exposure control program to protect personnel and monitor personnel who have been exposed to asbestos. Report suspected asbestos hazards immediately to the Safety Officer or your supervisor.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.19B CHAPTER B1.

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY. QUIZ KEY IS PROVIDED.

PART 1 - INITIAL MEDICAL QUESTIONNAIRE (Continued)

MEDICAL DATA (Continued)				Father		Mother	
	Yes	No	N/A	Yes	No	Yes	No
23 HAVE YOU EVER HAD CHRONIC BRONCHITIS?							
a IF YES DO YOU STILL HAVE IT?							
b WAS IT CONFIRMED BY A DOCTOR?							
c AT WHAT AGE DID IT START? (If not age)							
24 HAVE YOU EVER HAD EMPHYSEMA?							
a IF YES DO YOU STILL HAVE IT?							
b WAS IT CONFIRMED BY A DOCTOR?							
c AT WHAT AGE DID IT START? (If not age)							
25 HAVE YOU EVER HAD ASTHMA?							
a IF YES DO YOU STILL HAVE IT?							
b WAS IT CONFIRMED BY A DOCTOR?							
c AT WHAT AGE DID IT START? (If not age)							
26 HAVE YOU EVER HAD							
a ANY OTHER CHEST ILLNESSES *If yes, please specify							
b ANY CHEST OPERATIONS *If yes, please specify							
c ANY CHEST INJURIES *If yes, please specify							
27 HEART TROUBLE							
a HAS A DOCTOR EVER TOLD YOU THAT YOU HAD HEART TROUBLE?							
b IF YES HAVE YOU EVER HAD TREATMENT FOR HEART TROUBLE IN THE PAST TEN YEARS?							
28 HIGH BLOOD PRESSURE							
a HAS A DOCTOR EVER TOLD YOU THAT YOU HAD HIGH BLOOD PRESSURE (Hypertension)?							
b IF YES, HAVE YOU EVER HAD TREATMENT FOR HIGH BLOOD PRESSURE IN THE PAST TEN YEARS?							
29 WHEN DID YOU LAST HAVE YOUR CHEST X-RAYED? (Year)							
30 CHEST X RAY							
a WHERE DID YOU LAST HAVE YOUR CHEST X-RAYED? (If known)							
b WHAT WAS THE OUTCOME?							

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ASBESTOS EXPOSURE
PART 1 - INITIAL MEDICAL QUESTIONNAIRE (Continued)

MEDICAL DATA (Continued)				Father		Mother	
	Yes	No	N/A	Yes	No	Yes	No
34 EPISODES OF COUGH AND PHEGEM							
a HAVE YOU HAD PERIODS OR EPISODES OF (increased) COUGH AND PHEGEM LASTING FOR THREE WEEKS OR MORE EACH YEAR?							
*For persons who usually have cough and/or phlegm							
b FOR HOW LONG HAVE YOU HAD AT LEAST ONE SUCH EPISODE PER YEAR? (Number of years)							
35. WHEEZING/WHISTLING							
a DOES YOUR CHEST EVER SOUND WHEEZY OR WHISTLING?							
(1) When you have a cold							
(2) Occasionally apart from colds							
(3) Most days or nights							
b IF YES TO 35 a (1) (2) or (3), FOR HOW MANY YEARS HAS THIS BEEN PRESENT? (Number of years)							
36 WHEEZING/SHORTNESS OF BREATH							
a HAVE YOU EVER HAD AN ATTACK OF WHEEZING THAT HAS MADE YOU FEEL SHORT OF BREATH?							
b IF YES, HOW OLD WERE YOU WHEN YOU HAD YOUR FIRST SUCH ATTACK? (Number of years)							
c HAVE YOU HAD TWO OR MORE SUCH EPISODES?							
d HAVE YOU EVER REQUIRED MEDICINE OR TREATMENT FOR THESE ATTACKS?							
37 IF DISABLED FROM WALKING BY ANY CONDITION OTHER THAN HEART OR LUNG DISEASE, PLEASE DESCRIBE NATURE OF CONDITION(S) AND PROCEED TO QUESTION 39 a							
38 BREATHLESSNESS							
a ARE YOU TROUBLED BY SHORTNESS OF BREATH WHEN HURRYING ON THE LEVEL OR WALKING UP A SLIGHT HILL?							
b IF YES, DO YOU HAVE TO WALK SLOWER THAN PEOPLE OF YOUR AGE ON THE LEVEL BECAUSE OF BREATHLESSNESS?							
c DO YOU EVER HAVE TO STOP FOR BREATH WHEN WALKING AT YOUR OWN PACE ON THE LEVEL?							
d DO YOU EVER HAVE TO STOP FOR BREATH AFTER WALKING ABOUT 100 YARDS (or after a few minutes) ON THE LEVEL?							
e ARE YOU TOO BREATHLESS TO LEAVE THE HOUSE OR BREATHLESS ON DRESSING OR CLIMBING ONE FLIGHT OF STAIRS?							
39 CIGARETTE SMOKING							
a HAVE YOU EVER SMOKED CIGARETTES? *Has one and less than 20 packs of cigarettes or 12 oz of tobacco in a lifetime or less than 1 cigar, pipe or 1 day for 1 year							
b IF YES DO YOU NOW SMOKE CIGARETTES (As of most recent year)?							
c HOW OLD WERE YOU WHEN YOU FIRST STARTED REGULAR CIGARETTE SMOKING? (Number of years)							
40 PIPE SMOKING							
a HAVE YOU EVER SMOKED A PIPE REGULARLY? *Yes means more than 12 oz of tobacco in a lifetime							
b HOW OLD WERE YOU WHEN YOU FIRST STARTED PIPE SMOKING? (Number of years)							
c IF YOU HAVE STOPPED SMOKING A PIPE COMPLETELY, HOW OLD WERE YOU WHEN YOU STOPPED? (If not age, skip to item 42)							
(1) Age in years							
(2) Still smoking							
d ON THE AVERAGE OF THE ENTIRE TIME YOU SMOKED, HOW MUCH PIPE TOBACCO DID YOU SMOKE PER WEEK? (oz per week - a standard pack of tobacco contains 1-1 1/2 oz)							
(1) Age in years							
(2) Still smoking							
e HOW MUCH PIPE TOBACCO DO YOU SMOKE PER WEEK NOW?							
41 CIGAR SMOKING							
a DO OR DID YOU INHALE PIPE SMOKE (If not)							
(1) Not at all							
(2) Slightly							
(3) Moderately							
(4) Deeply							
b HAVE YOU EVER SMOKED CIGARS REGULARLY? *Yes means more than 1 cigar a week for 1 year							
c HOW OLD WERE YOU WHEN YOU FIRST STARTED REGULAR CIGAR SMOKING? (Number of years)							
d ON THE AVERAGE OF THE ENTIRE TIME YOU SMOKED, HOW OLD WERE YOU WHEN YOU STOPPED? (If not age, skip to item 42)							
(1) Age in years							
(2) Still smoking							
e HOW MANY CIGARS DO YOU SMOKE PER WEEK NOW?							
42 DO OR DID YOU INHALE CIGAR SMOKE (If not)							
(1) Not at all							
(2) Slightly							
(3) Moderately							
(4) Deeply							
43. SIGNATURE							
44. DATE SIGNED							

LG 9-11

LG 9-10

PART 1 - INITIAL MEDICAL QUESTIONNAIRE (Continued)

MEDICAL DATA (Continued)				Father		Mother	
Yes	No	N/A		Yes	No	Yes	No
31. WERE EITHER OF YOUR NATURAL PARENTS TOLD THAT THEY HAD A CHRONIC LUNG CONDITION SUCH AS							
a. CHRONIC BRONCHITIS							
b. EMPHYSEMA							
c. ASTHMA							
d. LUNG CANCER							
e. OTHER CHEST CONDITIONS							
f. IS PARENT CURRENTLY ALIVE?							
g. Please specify AGE IF LIVING AGE AT DEATH							
32. COUGH							
a. DO YOU USUALLY HAVE A COUGH? (Count a cough with first swallow or on first going out of doors. Exclude clearing of throat.) *If No, skip to question 32 c.							
b. DO YOU USUALLY COUGH AS MUCH AS FOUR TO SIX TIMES A DAY FOUR OR MORE DAYS OUT OF THE WEEK?							
c. DO YOU USUALLY COUGH AT ALL ON GETTING UP OR FIRST THING IN THE MORNING?							
d. DO YOU USUALLY COUGH AT ALL DURING THE REST OF THE DAY OR AT NIGHT?							
IF YES TO ANY OF ABOVE (32 a, b, c, or d), ANSWER THE FOLLOWING IF NO TO ALL, X "N/A" AND SKIP TO ITEM 33							
e. DO YOU USUALLY COUGH LIKE THIS ON MOST DAYS FOR THREE CONSECUTIVE MONTHS OR MORE DURING THE YEAR?							
f. FOR HOW MANY YEARS HAVE YOU HAD THE COUGH?							
33. PHELEM							
a. DO YOU USUALLY BRING UP PHELEM FROM YOUR CHEST? (Count phlegm with the first swallow or on first going out of doors. Exclude phlegm from the nose. Count swallowed phlegm.) *If No, skip to Item 33 c.							
b. DO YOU USUALLY BRING UP PHELEM LIKE THIS AS MUCH AS TWICE A DAY FOUR OR MORE DAYS OUT OF THE WEEK?							
c. DO YOU USUALLY BRING UP PHELEM AT ALL ON GETTING UP OR FIRST THING IN THE MORNING?							
d. DO YOU USUALLY BRING UP PHELEM AT ALL DURING THE REST OF THE DAY OR AT NIGHT?							
IF YES TO ANY OF ABOVE (33 a, b, c, or d), ANSWER THE FOLLOWING IF NO TO ALL, X "N/A" AND SKIP TO ITEM 34							
e. DO YOU USUALLY BRING UP PHELEM LIKE THIS ON MOST DAYS FOR THREE CONSECUTIVE MONTHS OR MORE DURING THE YEAR?							
f. FOR HOW MANY YEARS HAVE YOU HAD TROUBLE WITH PHELEM?							

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ASBESTOS EXPOSURE
PART 1 - INITIAL MEDICAL QUESTIONNAIRE (Continued)

MEDICAL DATA (Continued)				Yes		No		N/A	
Yes	No	N/A		Yes	No	Yes	No	Yes	No
34. EPISODES OF COUGH AND PHELEM									
a. HAVE YOU HAD PERIODS OR EPISODES OF (increased) COUGH AND PHELEM LASTING FOR THREE WEEKS OR MORE EACH YEAR? (For persons who usually have cough and/or phlegm)									
b. FOR HOW LONG HAVE YOU HAD AT LEAST ONE SUCH EPISODE PER YEAR? (Number of years)									
35. WHEEZING/WHISTLING									
a. DOES YOUR CHEST EVER SOUND WHEEZY OR WHISTLING									
(1) When you have a cold									
(2) Occasionally apart from colds									
(3) Most days or nights									
b. IF YES TO 35 a (1), (2) or (3), FOR HOW MANY YEARS HAS THIS BEEN PRESENT? (Number of years)									
36. WHEEZING/SHORTNESS OF BREATH									
a. HAVE YOU EVER HAD AN ATTACK OF WHEEZING THAT HAS MADE YOU FEEL SHORT OF BREATH?									
b. IF YES, HOW OLD WERE YOU WHEN YOU HAD YOUR FIRST SUCH ATTACK? (Number of years)									
c. HAVE YOU HAD TWO OR MORE SUCH EPISODES?									
d. HAVE YOU EVER REQUIRED MEDICINE OR TREATMENT FOR THE(S) ATTACK(S)?									
37. IF DISABLED FROM WALKING BY ANY CONDITION OTHER THAN HEART OR LUNG DISEASE, PLEASE DESCRIBE NATURE OF CONDITION(S) AND PROCEED TO QUESTION 39 a.									
38. BREATHLESSNESS									
a. ARE YOU TROUBLED BY SHORTNESS OF BREATH WHEN HURRYING ON THE LEVEL OR WALKING UP A SLIGHT HILL?									
b. IF YES, DO YOU HAVE TO WALK SLOWER THAN PEOPLE OF YOUR AGE ON THE LEVEL BECAUSE OF BREATHLESSNESS?									
c. DO YOU EVER HAVE TO STOP FOR BREATH WHEN WALKING AT YOUR OWN PACE ON THE LEVEL?									
d. DO YOU EVER HAVE TO STOP FOR BREATH AFTER WALKING ABOUT 100 YARDS (or after a few minutes) ON THE LEVEL?									
e. ARE YOU TOO BREATHLESS TO LEAVE THE HOUSE OR BREATHLESS ON DRESSING OR CLIMBING ONE FLIGHT OF STAIRS?									
39. CIGARETTE SMOKING									
a. HAVE YOU EVER SMOKE CIGARETTES? *Has one ever had more than 20 packs of cigarettes or 10 oz. of tobacco in a lifetime or less than 1 cigarette a day for 1 year?									
b. IF YES, DO YOU NOW SMOKE CIGARETTES (As of some month ago)?									
c. HOW OLD WERE YOU WHEN YOU FIRST STARTED REGULAR CIGARETTE SMOKING? (Number of years)									
40. CIGARETTE SMOKING (Continued)									
d. IF YOU HAVE STOPPED SMOKING CIGARETTES COMPLETELY, HOW OLD WERE YOU WHEN YOU STOPPED? (1) Age in years (2) Still smoking									
e. HOW MANY CIGARETTES DO YOU SMOKE PER DAY NOW?									
f. ON THE AVERAGE OF THE ENTIRE TIME YOU SMOKE, HOW MANY CIGARETTES DID YOU SMOKE PER DAY?									
g. DO OR DID YOU INHALE CIGARETTE SMOKE (If ever)									
(1) Not at all (2) Slightly (3) Moderately (4) Deeply									
40. PIPE SMOKING									
a. HAVE YOU EVER SMOKE A PIPE REGULARLY? *Yes means more than 12 oz. of tobacco in a lifetime									
b. HOW OLD WERE YOU WHEN YOU FIRST STARTED PIPE SMOKING? (Number of years)									
c. IF YOU HAVE STOPPED SMOKING A PIPE COMPLETELY, HOW OLD WERE YOU WHEN YOU STOPPED? (1) Age in years (2) Still smoking									
d. ON THE AVERAGE OF THE ENTIRE TIME YOU SMOKE, HOW MUCH PIPE TOBACCO DID YOU SMOKE PER WEEK? (For per hour - a standard pack of tobacco contains 1 1/2 oz.)									
e. HOW MUCH PIPE TOBACCO DO YOU SMOKE PER WEEK NOW?									
41. DO OR DID YOU INHALE PIPE SMOKE (If ever)									
(1) Not at all (2) Slightly (3) Moderately (4) Deeply									
41. CIGAR SMOKING									
a. HAVE YOU EVER SMOKE CIGARS REGULARLY? *Yes means more than 1 cigar a week for a year									
b. HOW OLD WERE YOU WHEN YOU FIRST STARTED REGULAR CIGAR SMOKING? (Number of years)									
c. IF YOU HAVE STOPPED SMOKING CIGARS COMPLETELY, HOW OLD WERE YOU WHEN YOU STOPPED? (1) Age in years (2) Still smoking									
d. ON THE AVERAGE OF THE ENTIRE TIME YOU SMOKE, HOW MANY CIGARS DID YOU SMOKE PER WEEK?									
e. HOW MANY CIGARS DO YOU SMOKE PER WEEK NOW?									
42. DO OR DID YOU INHALE CIGAR SMOKE (If ever)									
(1) Not at all (2) Slightly (3) Moderately (4) Deeply									
43. SIGNATURE									
44. DATE SIGNED									

ASBESTOS EXPOSURE CONTROL PROGRAM QUIZ

RATE/NAME: _____ **DIV:** _____ **DATE:** _____

CIRCLE THE CORRECT ANSWER

1. Asbestos material has been used aboard ship in:
 - A. Thermal insulation
 - B. Floor tile
 - C. Gasket material
 - D. Pipe hanger liners
 - E. All of the above

2. Non-emergency removals of asbestos material can only be done by:
 - A. Engineering Department personnel.
 - B. The Corpsman.
 - C. SIMA, the tender, or a contractor.
 - D. Your squadron.
 - E. None of the above.

3. Emergency at-sea removals of asbestos can only be authorized by the:
 - A. Chief Engineer
 - B. Safety Officer
 - C. Medical Officer
 - D. Commanding Officer
 - E. Type Commander

4. A ship that has been through the shipyard and had extensive asbestos insulation removal can be considered asbestos-free.
 - A. True
 - B. False

5. The only way to tell if material contains asbestos is:
 - A. See if it will burn.
 - B. Ask the Chief.
 - C. Taste it.
 - D. Have it analyzed by the tender laboratory.
 - E. None of the above.

6. If you are assigned to the ship's emergency three-person asbestos removal team, you will automatically be placed in the Asbestos Medical Surveillance Program (AMSP).
- A. True
 - B. False
7. Ships having asbestos insulation must maintain:
- A. An asbestos rip-out kit.
 - B. A trained three-man removal team.
 - C. Asbestos HEPA vacuum cleaners.
 - D. An ambient air breathing pump (except submarines).
 - E. All of the above.
8. Gaskets and packing which contains asbestos is not hazardous and requires no handling precautions.
- A. True
 - B. False
9. The most effective way of controlling asbestos dust is by:
- A. Wetting down the material.
 - B. Working after hours only.
 - C. Removing the material very rapidly.
 - D. Removing the material in small chunks.
 - E. None of the above.
10. Asbestos workers do not have a greater chance of developing lung cancer if they smoke.
- A. True
 - B. False

ASBESTOS QUIZ KEY:

1. E
2. C
3. D
4. B
5. D
6. A
7. E
8. B
9. A
10. B

LG #10

LESSON TOPIC: HAZARDOUS MATERIAL/HAZARDOUS WASTE PROGRAM

AVERAGE TIME: 60 Minutes (Handling, Storage and Disposal can be expanded into separate 30 minute lectures using the topic eight minute videotapes)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapters B3 and C23
- b. OPNAVINST 5090.1A, Chapter 17
- c. NSTM, Chapter 670
- d. NSTM, Chapter 593

TRAINING AIDS:

- a. Videotapes: "Hazardous Materials Control Afloat" (804939 DN); "Handling of Hazardous Materials Afloat" (803475 DN); "Storage of Hazardous Materials Afloat" (803476 DN); "Disposal of Hazardous Materials Afloat" (803495 DN)
- b. Samples of hazardous materials and hazardous waste labels
- c. HANDOUT #1 - Sample MSDS
- d. Quiz

OBJECTIVES:

The student should be able to define a hazardous material and hazardous waste, understand the Navy's hazardous waste minimization program and the command's responsibilities. The student should understand the general handling, storage, and disposal requirements for the hazardous materials they use on board. The student should know where to get, and be familiar with the information contained in, a Material Safety Data Sheet (MSDS).

TARGET AUDIENCE:

All users of hazardous material and supply personnel, including supervisors; who handle, store or dispose of hazardous materials.

REQUIREMENTS:

Initial and annual training for all hazardous material users, in accordance with OPNAVINST 5100.19B.

INTRODUCTION

Hazardous materials are used daily by every ship, in maintenance, repair, and cleaning. We could not maintain our operational effectiveness without using hazardous materials. In using hazardous materials we also produce waste. Hazardous materials can be used effectively and safely if care is taken in the handling, storage, and disposal. The Navy has developed a program to comply with OSHA and EPA regulations, and help minimize the amount of hazardous waste we produce. Strict regulations exist on storage of hazardous materials aboard ship to avoid fires and injury. All hands should understand and be aware of hazardous materials handling, storage and disposal requirements.

A. BACKGROUND

1. Hazardous materials

- a. Hazardous material is defined as any material which, because of its quantity, concentration, or physical or chemical characteristics, may pose a substantial hazard to human health or the environment. Hazardous materials include:

- (1) Flammable and combustible materials.
- (2) Toxic or poisonous materials.
- (3) Corrosive materials, such as strong acids and alkalies.
- (4) Oxidizing materials.
- (5) Aerosols.
- (6) Compressed gases.

- b. Some materials, considered hazardous, are not included in this program and are covered by separate directives. They include ammunition, radioactive material, medical waste, NBC or CBR materials, propellants, PCBs, and bulk fuels. The directives covering these items are:

- (1) NAVSEA OP-4, Ammunition Afloat - For weapons propellant and explosive guidance.
- (2) NSTM, Chapter 073 and NWP 62 - For NBC/CBR materials.

- (3) NSTM, Chapter 541 - For bulk fuels.
- (4) NAVMED P-5055 - For radioactive materials.
- (5) OPNAVINST 5100.19B, Chapter B1 - For disposal of asbestos waste material.
- (6) NAVSEAINST 5100.3B - For mercury control.
- (7) NAVSEA 9593-A1-MAN-010 - For PCBs.
- (8) NAVMEDCOMINST 6280.1 - For medical waste.
- (9) OPNAVINST 5090.1A - For plastic waste.

c. Discarded or excess hazardous material can be:

- (1) Hazardous materials turned in to stores (HMTIS), which can be returned to the supply system, if in like-new condition.
- (2) Hazardous materials turned in for disposal (HMTID), which is turned over to a base Public Works Department or other authority for disposal as hazardous waste.

GIVE EXAMPLES OF HAZARDOUS MATERIALS USED ON BOARD COMMON TO YOUR SHIP.

2. The Right-To-Know Law

a. A new OSHA regulation was adopted in the late 1980's. This regulation, 29 CFR 1910.1200, is titled the "Hazard Communication Standard."

- (1) This is also known as the "Right-to-Know" Law.
- (2) This law says that every employee has the right to know about the hazards in their workplace and how to protect themselves from the hazards.
- (3) The law applies to all U.S. employees, including Federal civilian and military personnel worldwide.

b. The "Hazard Communication Standard" affects manufacturers of hazardous materials, the employers who purchase them, and the employees who use them.

- (1) Manufacturers must properly label materials.

- (2) Manufacturers must provide a Material Safety Data Sheet (MSDS) for each hazardous material they produce.
 - (3) The hazardous material user must be familiar with the hazards and precautions on the MSDS for everything they use or handle. These MSDS's must be readily available to the user upon request. Items used or handled must also be properly labeled.
- c. These regulations also apply to forces afloat. OPNAVINST 5100.19B, Chapters B3 and C23 provide this information.

SHOW VIDEOTAPE "HAZARDOUS MATERIALS CONTROL AFLOAT."
ADD 18 MINUTES FOR VIDEOTAPE.

B. LABELING OF HAZARDOUS MATERIALS

1. Labeling provides the handler, shipper, and user of a hazardous material with critical information.
2. Every container of hazardous material must be labeled. Tank trucks and railroad tank cars, must be placarded with Department of Transportation (DOT) symbols.
3. Although the format of the label may differ from company to company, certain information is mandatory under the Hazard Communication Standard:
 - a. Identity of the material or chemical.
 - b. Name and address of the manufacturer or responsible party.
 - c. The appropriate hazard warning.
4. The Department of Defense (DoD) has a Hazardous Chemical Warning Label (DD 2521, 2522). They are used on DoD manufactured hazardous materials, re-packaged containers, tanks of hazardous chemicals, and unlabeled materials already in the DoD system.
5. There are several types of multicolored signs, placards, and decals providing visual hazard warnings. They can be symbols, words, pictures, shapes, or any combination. Two common hazard warnings are:

- a. National Fire Protection Association NFPA 704 diamond symbol system. It shows four colored blocks in a diamond formation. The top diamond is colored red for fire hazard. Clockwise, the next diamond is yellow, for reactivity; a blank diamond at the bottom for special information; and a blue diamond for health hazards. Number codes zero through four are used to show the degree of hazard.
- b. Department of Transportation (DOT) hazard identification is a colored diamond shape symbol for hazard class, such as flammables, corrosives, oxidizers, and explosives. They are used on hazardous materials containers shipped in interstate commerce.

SHOW AN EXAMPLE OF THE NFPA SYMBOL AND OTHER DECALS OR PLACARDS, IF AVAILABLE.

- c. Sometimes international symbols for goggles, gloves, aprons, and respirators are used. They are small pictures (called icons) on the label indicating the required protective equipment.
 - d. All these labels may be used to supplement the required OSHA labeling. They do not meet the OSHA labeling requirements alone. They should not be placed by Navy personnel on containers which are already properly labeled.
6. If you dispense a hazardous material into an unmarked container, you must transfer the label information to the new container:
 - a. Identity of the material or chemical.
 - b. Name and address of the manufacturer or responsible party.
 - c. An appropriate hazard warning.
 7. If you buy or receive a hazardous material with the minimum required labeling, you do not have to add any additional labeling.
 8. If a hazardous material is delivered to your ship without proper minimum labeling, you may REFUSE to accept the material from the supply system. If you accept the shipment, you must properly label the hazardous material.

SHOW EXAMPLES OF LABELS ON HAZARDOUS MATERIALS.

C. MATERIAL SAFETY DATA SHEETS (MSDS)

DISTRIBUTE HANDOUT #1, OR AN MSDS FOR ITEM USED ON BOARD.

1. Manufacturers produce Material Safety Data Sheets (MSDS) based on their testing and research of their products. By law, they must provide the data to hazardous materials users.
2. The MSDS shall be in English and shall contain at least the following information:
 - a. Identity of the material.
 - b. Hazardous ingredients.
 - c. Physical and chemical characteristics.
 - d. Physical hazards.
 - e. Reactivity.
 - f. Health hazards.
 - g. Precautions for safe handling and use.
 - h. Control measures.
 - i. Routes of entry into the body.
 - j. Emergency and first aid procedures.
 - k. Date of preparation of the MSDS or last change.
 - l. Name, address and phone number of a responsible party who can provide additional information on the hazardous material and appropriate emergency procedures.
3. Manufacturers may use any format or arrangement of this information, but every MSDS must include all the items.
4. The Department of Defense has developed a standard MSDS system for Navy people to use; who, as part of their job handle, store, use, or dispose of hazardous materials. The Hazardous Materials Information System (HMIS) is a collection of information taken from manufacturer's Material Safety Data Sheets. The HMIS also contains transportation and disposal information.

- a. HMIS is available on microfiche or Compact Disc - Read Only Memory (CD-ROM). Each ship has either the microfiche or the CD-ROM HMIS.

INDICATE WHAT YOUR SHIP HAS AVAILABLE AND WHERE.

- b. Some ships also have a paper copy file of Material Safety Data Sheets (MSDS) collected from various manufacturers and containers.
5. EVERY hazardous material user must have ACCESS to MSDSS for the items they use or handle. The ship must have an MSDS for every hazardous material on board.
- a. Every sailor using a hazardous material must be trained on the hazards associated with that material before they use it. MSDS's, on CD-ROM, microfiche, or hard copy, must be readily available to the individual to view it if they so desire.
 - b. The Medical Department must hold a file of MSDSS for every item on board for their use in case of an emergency. This can be a hard copy file or CD-ROM HMIS.
 - c. The ship's Hazardous Material/Hazardous Waste Coordinator must have an MSDS, on file or on CD-ROM HMIS, for every hazardous material onboard.
 - d. The Supply Department must hold an MSDS for every item they procure. Sometimes they must request the MSDS directly from the manufacturer or distributor.

D. PROGRAM RESPONSIBILITIES

1. According to OPNAVINST 5100.19B, Chapter B3, each afloat command must have a written hazardous materials/hazardous waste program.
2. Each CO must appoint, in writing, a Hazardous Materials/Hazardous Waste Coordinator.
3. Although every supervisor and crew member has certain responsibilities within this program, the HM/HW Coordinator is the primary program manager. Our HM/HW Coordinator is _____.

COVER RESPONSIBILITIES IN OPNAVINST 5100.19B, PAGES B3-1 THROUGH B3-5, IF DESIRED. GIVE SPECIFICS FOR YOUR COMMAND.

4. All hands must follow the strict handling, storage, and disposal regulations provided on hazardous materials.
5. The Division Officer and Work Center Supervisor play a critical role in the management of in-use hazardous materials and training of their personnel.
6. All supervisors must receive annual training on hazardous materials procedures.
7. All supply personnel must be trained when reporting onboard and then annually in hazardous materials procedures and the handling of hazardous materials turned in to stores (HMTIS) or turned in for disposal (HMTID).
8. All hands must receive job-specific training on hazardous materials when reporting onboard and then annually.
9. Damage control teams and fire parties must receive annual training, including a drill, on hazardous material spill response and emergency procedures.
10. Monthly spot checks and quarterly evaluations are made of the program to ensure compliance and effectiveness.

THIS SECTION MAY BE EXPANDED AND SERVE AS A SEPARATE LECTURE. SHOW THE VIDEOTAPE, "HANDLING OF HAZARDOUS MATERIALS AFLOAT" AT THE END OF THE LECTURE AND COVER SPECIFIC HANDLING PROCEDURES ON THE MSDS FOR A COMMONLY USED MATERIAL. WITH THE VIDEOTAPE THIS SECTION CAN BE EXPANDED TO 30 MINUTES.

E. HAZARDOUS MATERIALS HANDLING

1. Different hazardous materials may require different handling precautions. Navy publications, such as the NSTMs, and PMS MRCs may give these precautions.
 - a. The MSDS also provides handling precautions for the material in the section titled, "Precautions for Safe Handling and Use."
 - b. Safe handling often involves the use of personal protective equipment, ventilation, and specific precautions such as keeping it away from open flames.
 - (1) The MSDS provides a list of manufacturer recommended protective equipment and clothing.
 - (2) The Maintenance Requirement Card (MRC) lists protective clothing and equipment in the "Tools, Parts, Materials, Test Equipment" block.
 - (3) Technical manuals and other procedures may list protective equipment.
 - c. In general, all hazardous materials should be handled carefully, by trained personnel - even common cleaning materials.
2. General handling and use requirements have been defined for hazardous materials. They are given in OPNAVINST 5100.19B, Volume II, Chapter C23. They include:
 - a. Work center supervisors shall ensure, prior to using any hazardous material, people under their supervision were trained on the hazards associated with that material. They must also be provided with necessary protective clothing and equipment (for example, respirators, goggles, or gloves.)

- b. Workcenter supervisors shall ensure there is supply and exhaust ventilation in all spaces where people use hazardous materials. The systems must be in good operating condition and have been evaluated as adequate by an industrial hygiene survey.
- c. Never exceed one week's requirement as a ready supply of any hazardous material. Return surplus material to its appropriate storage area at the end of the watch or days work.
- d. Avoid breathing vapors or dust when using hazardous materials.
- e. Avoid contact with the eyes or prolonged contact with skin when using hazardous material.
- f. Prohibit smoking, drinking, or eating in areas where hazardous material is used.
- g. Ensure personal protective equipment (such as eye, ear, and respiratory) is readily available to all people working with hazardous material.
- h. Eye protection against irritating vapors or corrosive liquid chemicals shall consist of chemical goggles worn under a full face shield.
- i. The Gas Free Engineer must test and certify safe for entry and confined or enclosed spaces.
- j. Use a respirator with the appropriate filter or cartridge when exposed to particulate matter, vapors or hazardous gases.
- k. Consult the MSDS for specific safe handling requirements.

TO EXPAND LECTURE, SHOW THE VIDEOTAPE, "HANDLING OF HAZARDOUS MATERIALS AFLOAT." FOLLOW WITH A DISCUSSION OF MSDS FOR COMMONLY USED MATERIAL.

THIS SECTION MAY BE EXPANDED AND SERVE AS A SEPARATE LECTURE. SHOW THE VIDEOTAPE, "STORAGE OF HAZARDOUS MATERIALS AFLOAT" AT THE END OF THE LECTURE AND COVER SPECIFIC HANDLING PROCEDURES ON THE MSDS FOR A COMMONLY USED MATERIAL. WITH THE VIDEOTAPE THIS SECTION CAN BE EXPANDED TO 30 MINUTES.

F. STORAGE OF HAZARDOUS MATERIALS

1. Storage, or the lack of safe storage, for hazardous materials is a major problem on board ship.
2. Storage of in-use, flammable and combustible materials can be a fire and explosion hazard. In-use storage of reactive chemicals, such as oxidizers and corrosives, can cause both health and fire hazards.
3. Each type of hazardous material has different storage requirements. Some require only cool, dry storage. Others, such as flammables, must be stored in a space with a fire suppression system. These storage requirements are listed in OPNAVINST 5100.19B Chapter C23, and NSTM, Chapter 670. General storage requirements include:
 - a. Mark stowage compartments to identify the type of hazardous material stored and keep the compartment/materials clean and dry at all times.
 - b. Provide both supply and exhaust ventilation in stowage areas.
 - c. Allow only authorized personnel in stowage areas.
 - d. When transferring material from one container to another, ensure the existing precautionary labeling is retained and new containers labeled.
 - e. Stack containers so they will not crush containers under them, become imbalanced, or be hard to get to. For example, do not place containers in walkways, or balanced in the overhead.
 - f. Issue material on a first-in-first-out basis, considering shelf-life.
 - g. Prohibit smoking, drinking, and eating in stowage areas.

- h. Ensure open flames or spark producing items are not permitted in stowage areas.
 - i. Gas Free enclosed or confined stowage areas before entry or if the ventilation malfunctions and may allow the build-up of gases or vapors.
 - j. Operate only approved electrical switches in an explosive or suspected explosive atmosphere. Maintain explosion-proof fixtures in applicable hazardous material stowage areas.
 - k. Seal and protect all containers against physical damage and secure for sea.
 - l. Store powdered or solid type materials on shelves above liquid type chemicals. If possible, keep liquids low to the deck and in coamings or catch trays to contain spills.
4. Storerooms for bulk supplies are designed into the ship. The flammable liquid storeroom has special gas-tight light fixtures, an automatic fire extinguishing system, alarms and water-tight doors or hatches. Bulk storerooms are controlled by the Supply Department and hold items prior to issue. These storerooms cannot normally be used for in-use material because of custody and inventory procedures.
5. Flammable liquid issue rooms are provided on most ships, under the control of the Deck Department, Repair Department, or other user. They are equipped with alarms, automatic fire extinguishing systems, water-tight doors or hatches, and gas-tight light fixtures. The issue rooms are used for bulk storage of in-use flammable materials.
6. In-use hazardous materials in a workshop or office space are limited to one week's supply of open, in-use material. Hoarding or stocking up on hazardous materials, even cleaning products, is not authorized if it exceeds the weekly working stock.
7. Some shops are equipped with Flammable Liquid Storage Cabinets or Lockers (commercial or NAVSEA-type lockers). They are normally painted yellow, have self-closing doors, and have a sign saying "Flammable material, keep fire away". No matter how big the locker or cabinet is, or how many are in the space, you are not authorized to keep more than 30 gallons of flammable materials in one space.

7. To determine hazardous material in-use storage requirements you must determine if:
 - a. The material is compatible with other chemicals, or if it must be segregated from any nearby hazardous materials.
 - b. What is the hazard classification? - Is it an acid, oxidizer, alkaline, flammable, combustible, toxic, aerosol or compressed gas?
 - c. How much of the material will be kept on-hand as weekly working stock in-use?
 - d. Are there any special storage requirements listed on the MSDS?
 - e. What is the flash point of the material?
8. Consult OPNAVINST 5100.19B Chapter C23 and NSTM, Chapter 670 to determine special storage requirements.

GO TO OPNAVINST 5100.19B CHAPTER C23, AND READ THE STORAGE REQUIREMENTS FOR IN-USE FLAMMABLES, FOR EXAMPLES.

9. Personnel should never bring a new hazardous material, even cleaning material, into the workcenter without consulting the work center supervisor or division officer for storage authorization.

FOR THE EXPANDED LECTURE, SHOW THE VIDEOTAPE, "STORAGE OF HAZARDOUS MATERIALS AFLOAT." DISCUSS THE STORAGE REQUIREMENT ON AN MSDS FOR A COMMONLY USED HAZARDOUS MATERIAL.

THIS SECTION MAY BE EXPANDED AND SERVE AS A SEPARATE LECTURE. SHOW THE VIDEOTAPE, "DISPOSAL OF HAZARDOUS MATERIALS AFLOAT" AT THE END OF THE LECTURE AND DISCUSS THE DISPOSAL REQUIREMENTS FOR A COMMONLY USED ITEM. WITH THE VIDEOTAPE THIS SECTION CAN BE EXPANDED TO 30 MINUTES.

G. DISPOSAL OF HAZARDOUS MATERIALS

1. Due to strict EPA and OSHA regulations, the disposal of hazardous materials is carefully controlled to avoid damage to the environment and hazards to personnel.

- a. "Cradle to grave" regulations apply to all hazardous materials. A paperwork trail follows a hazardous material from the manufacturer to the shipper, warehouse, handler, and collector, to the ultimate disposal site.

YOU CAN USE THE EXAMPLE OF LOVE CANAL, WHERE A HAZARDOUS WASTE DUMP CONTAMINATED THE LAND AROUND A HOUSING TRACT. THE AREA HAD TO BE ABANDONED BECAUSE PEOPLE LIVING IN THE AREA WERE DEVELOPING HEALTH PROBLEMS.

- b. Each "generator" of hazardous waste must follow strict regulations. In the Navy, shore establishments, such as naval bases and shipyards, are designated hazardous waste generators. Normally, the base Public Works Department takes charge of waste disposal.

- (1) Afloat units are not considered "generators" of hazardous waste. Ships turn excess hazardous materials to their base Public Works or receiving authority. Once the material reaches Public Works custody they will arrange disposal, re-use, or recycling.
 - (2) Overseas, naval bases or the foreign base husbanding agent will contract to remove hazardous materials for disposal. These circumstances fall under different, local regulations.

2. HMTIS, or hazardous materials turned-in to stores.

- a. Excess, new, usable hazardous material may be turned-in to the Supply Department for reissue or to the base Defense Reutilization and Marketing Office (DRMO).

- (1) The materials must be in unopened, clean condition, with no damage to the container.

- (2) A transfer document, 1348-1, must be completed to return materials to DRMO or the Supply Center. Your Supply Department is familiar with these procedures.

3. HMTID, or hazardous materials turned-in for disposal.

- a. HMTID is excess, opened, damaged, or partially full containers of material, items contaminated with hazardous material such as rags and protective clothing, and the remains of processes or procedures such as chemical testing.
- b. Neither the material nor the container can be reused. This includes containers having residue of a hazardous material, such as lead paint, or more than one inch of the hazardous material remaining.
- c. HMTID cannot be mixed. For example, you cannot put waste paint, hydraulic fluid, lube oil, and paint thinner all in one can for disposal. The combination may react and cause a fire, explosion, or give off toxic vapors. Segregate each type of material. Ideally, return each type in the original container.
- d. Store HMTID where the original material was stored until removing it from the ship. If you originally kept the material in the flammable locker, you must keep the discarded material in a flammable locker or the same type safe stowage.
- e. HMTID must be labeled as to contents. The "WARNING-HAZARDOUS WASTE" label (NAVSEA 5100/4) is an optional label you may use to mark unlabeled containers. If the contents are not known, mark the container "unknown waste" and isolate it until turn over.

- f. HMTID is turned in to _____ in the Supply Department, who prepares a 1348-1 form and contacts Public Works Department for pick-up.

DISCUSS YOUR OWN SHIP'S DISPOSAL PROCEDURES HERE, IF THEY DIFFER FROM THOSE PRESENTED ABOVE.

- g. Never throw any hazardous material, or even empty hazardous material containers, into the regular trash or dumpsters unless your supervisor approves. Each base has federal, state, and local laws on hazardous waste. They may differ from base to base. At our homeport, we are required to:

DISCUSS YOUR LOCAL PUBLIC WORKS REQUIREMENTS, AND TELL WHAT ITEMS YOU MAY DISPOSE OF IN THE REGULAR TRASH. SHOW A HAZARDOUS WASTE LABEL.

- h. OPNAVINST 5100.19B, Appendix B3-C lists the disposal requirements for various hazardous materials. For example, you must put waste oils in containers for shore disposal. It also lists the items which are considered hazardous wastes. Very few items may be disposed of at sea anymore.
- i. When in doubt, check with your supervisor before disposing of any hazardous material. Severe penalties and fines can be imposed on ships for improper disposal of hazardous materials. In some cases, NJP or courts martial can result from hazardous materials incidents.

TO EXPAND THIS LECTURE, SHOW THE VIDEOTAPE "DISPOSAL OF HAZARDOUS MATERIALS AFLOAT." DISCUSS THE DISPOSAL PROCEDURES FOR A COMMONLY USED ITEM.

H. HAZARDOUS MATERIAL SPILLS

1. The workcenter responsible can normally clean up small spills of hazardous materials using the precautions provided in the MSDS. Small spills are generally less than five gallons of low toxicity material.
 - a. An example of a small spill is knocking over a can of floor wax and spilling a quart of material. There is no fire hazard and the material is not very toxic. The user could clean up the spill with paper toweling or a mop after consulting the MSDS.
 - b. Even a small spill of a hazardous material may require containerizing of the residue and cleaning materials for shore disposal. Always report all spills to your supervisor.
 - (1) You must be careful handling spilled material because there is a greater chance of skin and eye contact and inhalation of gases or vapors.
 - (2) Protective equipment which may not be necessary for handling the material may be required to clean-up the spill. Your supervisor will advise you on the equipment you need.
2. Larger spills of hazardous materials may threaten the safety of the ship, the environment or injure personnel. In such cases all personnel should evacuate the area immediately and report the spill to your supervisor, DC Central, the CDO, or the OOD.
 - a. An example of a large spill would be dropping a pallet load of five gallon paint cans onto the deck while taking on stores. This would be a fire hazard, a threat to the waterway, and a personnel exposure hazard.
 - b. Damage control actions, such as calling away the fire party, may be necessary for a large spill.
 - c. Hazardous material spilled into navigable waters must be reported in accordance with OPNAVINST 5090.1A, the Environmental and Natural Resources Program Manual.

- (1) Environmentally significant spills must be reported by OPREP-3.
 - (2) An environmentally significant spill is one which has high press or public interest or is considered a catastrophic event.
 - (3) Special rules also apply to spills which occur in navigable waters in foreign ports.
3. If the hazardous material spill is a threat to the ship or personnel, the CDO, OOD, DCA, or fire marshal will decide on a course of action.
- a. Hazardous material spill response procedures are provided in OPNAVINST 5100.19B, Appendix B3-A.
 - b. The DCA must train all damage control personnel in hazardous material spill response and conduct one spill response drill per year.
 - c. The DCA or CDO will use standard damage control procedures, plus information from Material Safety Data Sheets in conducting the spill clean-up.
 - d. Spill clean-up kits are located in Repair Lockers _____ (GIVE THE LOCATIONS OF YOUR SPILL KITS).
 - (1) These spill kits contain absorbent materials, protective equipment, labels, and other materials used by damage control personnel for a large spill.
 - (2) These kits are maintained by the DCA.

A SEPARATE LESSON GUIDE IS PROVIDED ON HAZARDOUS MATERIAL SPILL RESPONSE, WHICH INCLUDES A VIDEOTAPE.

SUMMARY:

Hazardous materials are required for us to do our job, but they can be hazardous to our health and the environment if improperly handled. Rules and regulations on hazardous materials handling, storage, and disposal have been implemented for your safety and the safety of the ship. You have the right to know safety and health information about hazardous materials, and you must be trained in their use. Careful handling, storage and disposal of hazardous materials is an all hands evolution.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.19B CHAPTERS B3 AND C23, AS WELL AS NSTM, CHAPTER 670, NSTM, CHAPTER 593, AND OPNAVINST 5090.1A.

ADMINISTER 10 QUESTION QUIZ PROVIDED. REPRODUCE LOCALLY. QUIZ KEY IS PROVIDED.

DoD Hazardous Materials Information System
DoD 6050.5-LR
AS OF 1 Nov 90
For U.S. Government Use Only

SC: 6810

UIN: 002709978 Manufacturer's CAGE: 32939

Part No. Indicator: A

Part Number/Trade Name: NITRIC ACID,N/1

=====

General Information

=====

Safety Data Action Code:

Safety Focal Point: D

Record No. for this Safety Entry: 001

Total Safety Entries-This Stock No.: 006

Status:

Date MSDS Prepared: N/K

Safety Data Review Date: 26APR88

Supply Item Manager: CX

Item Name: NITRIC ACID,REAGENT

Manufacturer's Name: POLYSCIENCES,INC.

Manufacturer's Street: 400-VALLEY ROAD

Manufacturer's P.O. Box: N/K

Manufacturer's City: WARRINGTON

Manufacturer's State: PA

Manufacturer's Country: US

Manufacturer's Zip Code: 18976

Manufacturer's Emergency Telephone Number: 215-343-6484

Manufacturer's Information Telephone Number: 215-343-6484

SDS Preparer's Name: N/K

Preparer's Company:

Preparer's Street or P.O. Box:

Preparer's City:

Preparer's State:

Preparer's Zip Code:

Distributor/Vendor No. 1: N/R

Distributor/Vendor No. 1 CAGE:

Distributor/Vendor No. 2:

Distributor/Vendor No. 2 CAGE:

Distributor/Vendor No. 3:

Distributor/Vendor No. 3 CAGE:

Distributor/Vendor No. 4:

Distributor/Vendor No. 4 CAGE:

Other MSDS Number:

SDS Serial Number: BDRV L

Specification Number: MIL-W-15000

Specification Type, Grade, Class: CLASS A

Hazard Characteristic Code: C2

Unit Of Issue: QT

Unit Of Issue Container Quantity: 1.0 QT

Type Of Container: BOTTLE

Net Unit Weight: 32.0 OZ

RC/State License Number: N/R

Net Explosive Weight:

Propellant Weight-Ammo: N/R
t Guard Ammunition Code:

=====

Ingredients/Identity Information

=====

rietary: NO
edient Action Code:
edient Focal Point: D
edient Sequence No.: 01
H (RTECS) No.: QU5775000
NO.: 7697-37-2
edient: NITRIC ACID
H TLV: <7.0
L PEL: 2 PPM/4 STEL
H TLV: 2 PPM/4 STEL; 8990
r Recommended Limit: N/R

rietary: NO
edient Action Code:
edient Focal Point: D
edient Sequence No.: 02
H (RTECS) No.: ZC0110000
NO.: 7732-18-5
edient: WATER
ent: >63.0
L PEL: NOT ESTABLISHED
H TLV: NOT ESTABLISHED
r Recommended Limit:

=====

Physical/Chemical Characteristics

=====

earance And Odor: CLEAR COLORLESS LIQUID;PUNGENT ODOR.
ling Point: 212F/100C
ling Point: >0.0
or Pressure (MM Hg/70 F): N/K
or Density (Air=1): N/K
ific Gravity: 1.03
omposition Temperature: N/K
oration Rate & Reference: N/K
ability In Water: COMPLETE
ent Volatiles By Volume: 100
osity:
N/K
ioactivity:
n (Radioactive Matl):
etism (milligauss):
rosion Rate (IPY): N/K
ignition Temperature: N/K

=====

Fire and Explosion Hazard Data

=====

ash Point: NONE
ash Point Method: N/R
wer Explosive Limit: N/K
per Explosive Limit: N/K
tinguishing Media: USE SUITABLE MEDIA FOR SURROUNDING FIRES.
ecial Fire Fighting Procedures: USE NIOSH/MSHA APPROVED SCBA IN AN E
EA.
usual Fire and Explosion Hazards: FUMES ARE TOXIC USE REASONABLE CAF

Reactivity Data

ability: YES
nditions To Avoid (Stability): MAY DISCOLOR ON EXPOSURE TO LIGHT
terials To Avoid: BASES, REDUCING AGENTS, ALCOHOL, ALKALI METALS, COPPER
GANIC MATERIAL & AMINES.
zardous Decomposition Products: NITROGEN OXIDES
zardous Polymerization Occur: NO
nditions To Avoid (Polymerization): N/K

Health Hazard Data

50-LC50 - Mixture: N/K
ute Of Entry - Inhalation: YES
ute Of Entry - Skin: N/K
ute Of Entry - Ingestion: YES
alth Hazards - Acute And Chronic: ACUTE: CORROSIVE, CHEST PAINS, BREATH
FFICULTY, COUGHING, G.I. DISTURBANCE, LUNG IRRITATION AND EDEMA MAY BE I
RONIC: TISSUE DAMAGE, LUNG DAMAGE.
rcinogenity - NTP: N/K
rcinogenity - IARC: N/K
rcinogenity - OSHA: N/K
planation Of Carcinogenity: N/R
gns and Symptoms Of Overexposure: SEE HEALTH HAZARD DATA.
dical Conditions Aggravated By Exposure: PRE-EXISTING CONDITIONS MAY
RSEN;
ergency And First Aid Procedures: EYES: FLUSH EYES W/WATER FOR AT LEA
UTES, CALL A PHYSICIAN. INHALATION: REMOVE TO FRESH AIR; GIVE OXYGEN, CA
YSICIAN. INGESTION: CORROSIVE; DO NOT INDUCE VOMITING; GIVE WATER AND CA
YSICIAN AT ONCE.

Precautions for Safe Handling and Use

eps if Material is Released or Spilled: USE PROPER PERSONAL
OTECTION: NEUTRALIZE WITH SOAP AND RECOVER FOR PROPER DISPOSAL.
utralizing Agent: SODA ASH
ste Disposal Method: DISPOSE OF COLLECTED MATERIAL IN ACCORDANCE WIT
ATE AND FEDERAL REGS.
ecautions to be Taken in Handling and Storing: STORE IN COOL DRY ANI
NTILATED AREA. KEEP AWAY FROM COMBUSTIBLE MATERIALS. DO NOT USE CONTAM
OTHES.
her Precautions:

Control Measures

piratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR FOR ACID MIST
VE PEL/TLV.

tilation: LOCAL/GENERAL TO MAINTAIN TLV/PEL BELOW THE LIMITS.

ective Gloves: RUBBER

Protection: SAFETY GOGGLES

er Protective Equipment: SAFETY SHOWER AND EYE BATH

k Hygienic Practices: AVOID CONTACT WITH EYES AND SKIN:DO NOT BREATHE
ORS/MIST.WASH THOROUGHLY AFTER EACH USE.

plemental Safety and Health Data: MSDS RECEIVED BY DGSC-SLM:APRIL 1,19

PROGRAM QUIZ

_____ DIV: _____ DATE: _____

SWER

"Know" law ensures every user of hazardous

- A. A Material Safety Data Sheet available for the item used.
- B. A proper label on the item.
- C. Training in safe handling of hazardous materials.
- D. Training in how to read an MSDS.
- E. All of the above.

2. HMTID is:

- A. Hazardous material turned in to stores.
- B. Hazardous material which cannot be reused.
- C. Always mixed in one barrel.
- D. Never labeled.
- E. None of the above.

3. Each command must have a ship's hazardous materials program instruction.

- A. True
- B. False

4. A Material Safety Data Sheet does not need to be available the ship for common cleaners like floor wax and pine oil.

- A. True
- B. False

5. Your in-use hazardous materials kept in the work center cannot exceed:

- A. The amount you need for deployment.
- B. One-year's worth.
- C. Weekly working stock.
- D. Daily usage amounts.
- E. Monthly PMS requirements.

6. The maximum amount of flammable materials in flammables cabinets, per space, cannot exceed:

- A. 10 gallons.
- B. 30 gallons.
- C. The capacity of the cabinet.
- D. 60 gallons.
- E. 12 gallons.

7. The DCA must train damage control personnel in hazardous material spill response and conduct an annual drill.

- A. True
- B. False

8. To safely handle a hazardous material during PMS, you must wear the protective equipment listed:

- A. On every hazardous material label.
- B. On the Maintenance Requirement Card (MRC).
- C. In the OPNAVINST 5100.19B.
- D. On the shipping box.
- E. None of the above.

9. All empty hazardous material containers may be thrown in the dumpster.

- A. True
- B. False

10. The ship needs to label hazardous materials if:

- A. The hazard label was on the shipping box and inner containers had no hazard labels.
- B. The material is put into an unlabeled container.
- C. The label is damaged or destroyed.
- D. A hazard warning was not included on the label.
- E. All of the above.

HAZARDOUS MATERIAL QUIZ KEY

1. E
2. B
3. A
4. B
5. C
6. B
7. A
8. B
9. B
10. E

LG #11

LESSON TOPIC: USE AND CARE OF PERSONAL PROTECTIVE EQUIPMENT

AVERAGE TIME: 30 Minutes (add 14 minutes for the videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B12

TRAINING AIDS:

- a. Videotape: "A Simple Choice" (35142-DN)
or "Danger Zone - Your Head" (803186-DN)
or "The Color of Danger" (22086-DN)
- b. Sample of protective equipment such as
gloves, goggles, face shield and apron
- c. Quiz

OBJECTIVES:

The student should understand the purpose of personal protective equipment, the selection of the proper protection, and the care of the equipment.

TARGET AUDIENCE:

All users of personal protective equipment, including supervisors.

REQUIREMENT:

Initial and annual training for all users of personal protective equipment in accordance with OPNAVINST 5100.19B.

INTRODUCTION

The Navy is responsible for providing you with a safe and healthy work environment. Work shops and spaces are designed to be safe, with good ventilation and safe machinery, whenever possible. Aboard some older ships, and in places converted from original ship design into work spaces, hazards may exist. These hazards are dealt with through engineering controls, if feasible. When design and engineering controls do not effectively protect the worker, personal protective equipment (PPE) and clothing may be necessary. Protective equipment is always a last resort, since it is expensive and hard to enforce. Where protective equipment is required, the command is obligated to provide workers with the correct, safe equipment.

A. BACKGROUND

1. For thousands of years, workers have used various means to protect themselves from hazards in the workplace. In the lead mines in ancient Italy, workers used animal skins filled with air as respiratory protection. Gloves for protection against sharp metal were commonly used.
2. Protective equipment does not "eliminate hazards." It is the last "line of defense" the worker has against the hazard.
3. Where worker exposures to hazards cannot be controlled by any other means, or as an interim measure, personal protective equipment may be the only option.
4. Most personal protective equipment (PPE) is designed according to American National Standards Institute (ANSI) standards and must pass stringent testing. There are ANSI standards for hard hats, safety glasses, and steel toed safety shoes, for example.
 - a. Respiratory protection is tested and approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA).
 - b. Hearing protection devices are assigned Noise Reduction Ratings (NRR) under guidelines set by the Environmental Protection Agency.
5. If ANSI standards cover the safety equipment, only approved safety equipment may be used by Navy personnel. The equipment will state somewhere on the label exactly what ANSI standard the item meets.

B. RESPONSIBILITIES

1. According to OPNAVINST 5100.19B, Chapter B12, each command is responsible for providing the correct personal protective equipment to all applicable workers. The command must provide adequate funding and support to procure and maintain protective equipment for the crew.
 - a. For example, steel toe safety shoes are issued to all enlisted personnel at Recruit Training Commands. When safety shoes exhibit wear and no longer provide safety protection, the command should provide standard stock safety shoes as organizational clothing.
2. The Safety Officer assists in the selection of proper protective equipment. He or she monitors work areas and processes to see if personnel are wearing their protective equipment and if it is the correct equipment. The Safety Officer may ask for Industrial Hygiene Officer assistance to evaluate the hazards and recommend protective equipment.
3. Division Officers must stock and provide protective equipment required for their division. The Division Officer must also:
 - a. Train all personnel in selection and use of PPE.
 - b. Train personnel in the care and maintenance of the PPE.
 - c. Enforce the use of all PPE.
4. All hands must cooperate in wearing required PPE.

C. SELECTION OF PERSONAL PROTECTIVE EQUIPMENT

1. Protective equipment must be selected to provide adequate protection against a specific hazard. For example, it would be worthless wearing plastic gloves while using paint thinner that melts plastic!
2. Selecting PPE starts with evaluating the hazard:
 - a. What type of material is being handled?
 - b. Is there adequate ventilation?
 - c. Does the Material Safety Data Sheet (MSDS) require PPE?

- d. How long is the worker using the material?
 - e. Will the material cause severe injury if splashed in the eyes?
 - f. Does the work generate sharp chips or dust?
 - g. Does the PMS MRC require certain protective equipment?
 - h. Does wearing protective equipment make sense?
3. In most instances, technical manuals, MSDS's, procedure and PMS MRCs define protective equipment requirements.

D. TYPES OF PROTECTIVE EQUIPMENT

- 1. Protective equipment is designed to protect the body. Each item is specific for a certain hazard and body part. Equipment is available to protect all of you, from your head to your toes.
 - a. Head protection
 - (1) Helmets, cranials and hard hats
 - b. Eye protection
 - (1) Goggles (chemical and impact)
 - (2) Safety glasses
 - (3) Welding/brazing goggles and helmets
 - (4) Face shields
 - c. Hearing protection
 - (1) Ear plugs
 - (2) Ear muffs
 - d. Respiratory protection
 - (1) Air-purifying respirators
 - (2) Air-supplying respirators
 - e. Full body protection
 - (1) Coveralls
 - (2) Welders leathers
 - (3) Aprons

f. Hand and arm protection

- (1) Rubber sleeves
- (2) Rubber electrical safety gloves
- (3) Chemical protective gloves
- (4) Leather gloves
- (5) Hot work gloves

g. Back protection and fall protection

- (1) Back supports
- (2) Safety harnesses

h. Knee protection

- (1) Kneeling pads
- (2) Knee pads

i. Foot protection

- (1) Steel toe shoes
- (2) Molders boots
- (3) Electrical safety boots
- (4) Metatarsal protectors

j. Flotation equipment

- (1) Kapok life jackets
- (2) Inflatable life jackets

SHOW VARIOUS EXAMPLES OF SAFETY PROTECTIVE EQUIPMENT

E. CARE AND MAINTENANCE OF PROTECTIVE EQUIPMENT

- 1. Your PPE can only take care of you, if you take care of it.
- 2. If protective equipment is assigned to you for your exclusive use, such as safety shoes, you are responsible for the care of the equipment.
- 3. If the equipment is issued and then turned-in after use, the maintenance is usually done by the issuer. For example, the electrical tool issue shop issues you goggles, gloves, and hearing protection with every tool. When you return those items, the tool issue custodian cleans and inspects the equipment.

4. Before use, every item of protective equipment should be inspected for visible wear, missing parts, dirt, and damage. If there is PMS coverage for the item, ensure the PMS is accomplished. All electrical safety rubber gloves are covered by a situational MRC and must be inspected and powdered prior to every use.
 - a. Bring damaged protective equipment to the attention of your supervisor. Never use cracked hard hats, for example.
 - b. Most protective equipment, such as goggles, are very inexpensive and should be replaced when badly scratched or missing straps.
 - c. Never try to "jury-rig" protective equipment straps or parts.
 - d. Clean and disinfect protective equipment before passing it to another user.
 - e. Store your protective equipment in a clean, dry place, in a plastic bag if possible.
 - f. Work center supervisors should train their personnel in the care and maintenance of protective equipment when issued, and then annually.

F. PROTECTIVE EQUIPMENT GUIDANCE

1. OPNAVINST 5100.19B gives protective equipment guidance for specific items, such as respirators, and general items, such as safety shoes.
2. The MSDS will specify protective equipment the manufacturer recommends for the hazardous material.
3. The "Tools, Parts, Materials and Test Equipment" block of each MRC will designate required protective equipment by SPMIG number. The SPMIG will give the stock number for the item. You must use all required protective equipment when doing the PMS.
4. Technical manuals and work procedures frequently recommend protective equipment.
5. Your supervisor or Safety Officer can recommend protective equipment.

SHOW VIDEOTAPE, "A SIMPLE CHOICE." OTHER VIDEOTAPES ON SPECIFIC PROTECTIVE EQUIPMENT ARE LISTED IN THE INTRODUCTORY CHAPTER OF THIS MANUAL.

PERSONAL PROTECTIVE EQUIPMENT QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER

1. Making personnel wear protective equipment is always preferred over redesigning the work space.

- A. True
- B. False

2. The command must provide funding for and provide all protective equipment required for crew members.

- A. True
- B. False

MATCHING

- | | |
|------------------------------------------|------------------------------------------------------------------|
| _____ 3. Electrical safety rubber gloves | a. Required for cargo handlers and crane operators. |
| _____ 4. Reusable respirator masks | |
| _____ 5. Chemical splash goggles | b. Issued with most electrical tools. |
| _____ 6. Safety glasses | c. Worn over safety glasses or goggles. |
| _____ 7. Ear plugs | |
| _____ 8. Hard hats | d. Must always be disinfected and valves checked before reissue. |
| _____ 9. Face Shields | |
| _____ 10. Safety shoes | e. Worn in posted noise hazardous areas. |
| | f. Must be worn when working with corrosive liquid |
| | g. Are protection when grinding |
| | h. Part of your sea bag |

PERSONAL PROTECTIVE EQUIPMENT QUIZ KEY

1. B
2. A
3. B
4. D
5. F
6. G
7. E
8. A
9. C
10. H

LG #12

LESSON TOPIC: GAS FREE ENGINEERING PROGRAM

AVERAGE TIME: 30 Minutes (add 18 minutes for videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B8
- b. NSTM 074 Vol 3

TRAINING AIDS:

- a. Videotape: "Hazardous Atmosphere Testing" (25696-DN)
- b. Examples of gas-free testing meters and draeger tubes
- c. Sample gas-free certificate
- d. Quiz

OBJECTIVES:

All students should understand the need for gas free engineering, the hazards associated with confined spaces, and how to request gas free services before entering a confined space. Students should also understand the requirements of personnel entering confined spaces, including personal protection, and rescue procedures.

TARGET AUDIENCE:

All hands, including supervisors.

REQUIREMENT:

All personnel assigned to gas free engineering duties, in accordance with OPNAVINST 5100.19B.

INTRODUCTION:

Entry into, work in, or work on confined or enclosed spaces may cause injury, illness, fires and explosions, or death. The hazards result from flammable or explosive materials or atmospheres, toxic material, or an oxygen-depleted atmosphere. Confined and enclosed spaces are not normally inhabited, and are considered unsafe for entry or work until the air has been tested. A gas free certificate is issued stating the hazard or special precautions. Only by carefully testing and retesting the air in confined and enclosed spaces can we ensure the safety and health of personnel working in these areas.

A. BACKGROUND

1. Confined and enclosed spaces

- a. Ships are compartmentalized when built to aid in watertight integrity and stability. Small voids, compartments, and tanks are built into the lower and outer hull of the ship.
- b. Throughout the ship, air-tight and water-tight compartments may exist, such as magazines and flammable storage compartments.
- c. These voids, tanks and enclosed spaces lack ventilation. With no air coming into the space, toxic vapors and gases may build up. Rust in the space may use up the available oxygen.
- d. Some voids and tanks may not be opened to the atmosphere for years or decades. On board one older aircraft carrier, a World War II rifle was found in a void sealed since the 1940's.

2. Health and fire hazards

- a. A lack of oxygen in a confined space will not support life and may asphyxiate workers.
- b. Toxic gases or vapors from paint or tank contamination may cause asphyxiation or intoxication.
- c. A flammable vapor or gas build-up could lead to a serious explosion or fire.

- d. Any combination of the above could lead to fatalities or serious material damage if workers try to enter or work in the unknown atmosphere.
- e. When testing the atmosphere in confined or enclosed spaces we look for:
 - (1) Lack or excess of oxygen
 - (2) Hydrocarbons
 - (3) Carbon monoxide
 - (4) Carbon dioxide
 - (5) Hydrogen sulfide gas
 - (6) Various toxic vapors
 - (7) Upper and lower explosive levels
- f. These tests will indicate whether, and under what conditions, work can be conducted inside the space.

SHOW VIDEOTAPE "HAZARDOUS ATMOSPHERE TESTING, IF AVAILABLE."

B. GAS FREE ENGINEERING PROGRAM

- 1. The Navy developed the gas free program to standardize and document gas freeing procedures for both confined space entry and damage control situations.
- 2. The program is applicable to all Navy ships. Submarine gas free engineering is covered in the Nuclear Powered Submarine Atmosphere Control Manual and NSTM 074, instead of the NAVOSH Program Manual for Forces Afloat.
- 3. The program consists of:
 - a. Observance and enforcement of required gas free procedures.
 - b. Staffing the program with trained, qualified, and certified gas free engineering personnel.
 - c. Procedures for requesting gas freeing services.
 - d. Inspection of operations for compliance.

- e. Providing the Gas Free Engineer with sufficient instruments and equipment to do the job.
 - f. Training of all hands in the hazards of, and precautions for, confined or enclosed spaces.
 - g. Documentation using required records and logs.
- 4. Every ship must have at least one person properly trained, qualified, and certified as the Gas Free Engineer.
 - 5. A sufficient number of Gas Free Engineering Petty Officers (GFEPPO's) must be trained, qualified, and certified to assist the Gas Free Engineer.
 - 6. On board this ship the Gas Free Engineer is_____.
 - 7. All hands must understand how the gas free engineering program works, the restrictions on confined or enclosed spaces, how to request gas free services, and procedures for helping a shipmate in an emergency involving a confined or enclosed space.
 - a. All confined or enclosed spaces shall be considered hazardous.
 - b. Entry or work in confined or enclosed spaces is prohibited until they have been inspected, tested, and issued a gas free certificate.
 - c. Entry into, or hot work, in fuel related spaces is allowed only with Commanding Officer's permission for each occasion.
 - d. Entry into a space deemed Immediately Dangerous to Life or Health (IDLH) is prohibited under normal operations. Commanding Officer's permission is required to enter an IDLH space and only in an extreme emergency or rescue.
 - e. Enclosed or confined spaces must be cleaned and ventilated before entry to work.
 - f. Care must be taken not to introduce toxic, flammable or oxygen depleting materials during the work in a confined or enclosed space.

C. GENERAL RULES AND RESCUE PROCEDURES

1. There are specific safety rules which apply to personnel working in or around confined or enclosed spaces:
 - a. Never work alone. An observer or outside attendant is required, and communication established between the observer and worker inside. The GFE will determine communication type and frequency of contact. When entering an IDLH (Immediately Dangerous to Life or Health) atmosphere, there must be at least one trained standby person, with a suitable respirator, in the nearest uncontaminated area.
 - b. Exhaust ventilation should be used, even if respirators are also required and used.
 - c. Obey the requirements and limitations outlined on the Gas Free Certificate. The certificate will be posted at the entrance to the space. It will indicate the conditions that exist at the time the tests were conducted, such as:

SHOW A SAMPLE OF A COMPLETED GAS FREE CERTIFICATE AND EXPLAIN THE DIFFERENT SECTIONS.

- (1) NOT safe for personnel - NOT safe for hot work.
 - (2) NOT safe for personnel without protection - NOT safe for hot work.
 - (3) SAFE for personnel - NOT safe for hot work.
 - (4) SAFE for personnel - SAFE for hot work.
 - (5) INERTED - NOT SAFE for personnel INSIDE - SAFE for hot work OUTSIDE
- d. The Gas Free Certificate is only good for no more than 8 hours, then the testing must be repeated.
 - e. Wear the protective equipment required by the Gas Free Certificate and your supervisor. This may include tending lines, harnesses, gloves, goggles and/or respirators.

f. NEVER ENTER A SPACE EVEN IF YOU SEE A BUDDY IN THE SPACE UNCONSCIOUS! Report the incident and wait for help. Never enter without special respiratory equipment and a backup assistant. Several fatalities have occurred among would-be rescuers.

- (1) Emergency and rescue control points will be established prior to space entry.
- (2) Attendant personnel shall attempt rescue only from the outside of the space, using the tending line.
- (3) All personnel assigned to confined or enclosed space work shall be trained in rescue procedures.
- (4) Wear Self-Contained Breathing Apparatus or Emergency Breathing Apparatus, with an auxiliary self-contained air supply containing at least a 15 minute air supply, to enter an atmosphere that is Immediately Dangerous to Life and Health (IDLH).

2. Requesting gas free services

a. Whether for repairs, maintenance or PMS, personnel who have a need to enter a confined or enclosed space must request the space be tested and gas freed.

- (1) Contact the DCA or fire marshal to arrange these services.

GIVE SPECIFIC POINT OF CONTACT OR PROCEDURE FOR YOUR COMMAND.

- (2) The Gas Free Certificate is only good for 8 hours from the time of testing. Make arrangements for retesting, if necessary.

SUMMARY:

The gas free engineering program was established to deal with the extreme hazards of entering confined or enclosed spaces aboard ship. Each ship has a trained, qualified and certified Gas Free Engineer and assistant Petty Officers. The rules concerning entering confined or enclosed spaces are very strict. All hands must be aware that any entry into such a space, without authorization, can be fatal.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.19B CHAPTER B8
AND NSTM CHAPTER 074 VOLUME 3.

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY.
QUIZ KEY IS PROVIDED.

GAS FREE ENGINEERING PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER

1. Every confined or enclosed space is considered hazardous.

- A. True
- B. False

2. Most Gas Free Certificates are:

- A. Good for however long the space is opened.
- B. Good for 8 hours only.
- C. Good for 24 hours.
- D. Good for an entire shipyard period.
- E. None of the above.

3. The observer stationed outside the confined space goes into the space right away if the worker has a problem.

- A. True
- B. False

4. Commanding Officer's permission is required to enter a fuel-related space, such as a fuel tank.

- A. True
- B. False

5. If a void cover is off, and the space has been opened for several days, it is safe for entry.

- A. True
- B. False

6. Hot work is never allowed in any void at any time.

- A. True
- B. False

7. Ventilation of a confined space is required even though the workers may be wearing respiratory protection.

- A. True
- B. False

8. The Gas Free Engineer tests the atmosphere in confined spaces for:

- A. Lack of oxygen.
- B. Toxic gases.
- C. Carbon monoxide.
- D. Explosive vapor.
- E. All of the above.

9. The Gas Free Certificate must be posted at the entrance of the confined or enclosed space.

- A. True
- B. False

10. Only trained personnel should ever attempt a rescue from a confined or enclosed space.

- A. True
- B. False

GAS FREE ENGINEERING QUIZ KEY

1. A
2. B
3. B
4. A
5. B
6. B
7. A
8. E
9. B
10. A

LG #13

LESSON TOPIC: RADIATION SAFETY/RADIOFREQUENCY RADIATION HAZARDS

AVERAGE TIME: 30 Minutes (Add 14 minutes for either videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B9
- b. SPAWARINST 5100.12A
- c. NAVMED P-5055
- d. NAVMEDCOMINST 6470.2
- e. DODINST 6055.11

TRAINING AIDS:

- a. Videotape: "Radiofrequency Radiation Health Hazards" (803672-DN) and "Laser Safety" (34739-DN)
- b. Sample RF hazard signs (OPNAVINST 5100.19B Appendix B9-D), Ionizing Radiation warning signs and Laser warning signs, if available
- c. Quiz

OBJECTIVES:

All students should understand the health hazards of RF, ionizing and non-ionizing radiation exposure, and the precautions required when working around these sources.

TARGET AUDIENCE:

Initial training for all personnel with potential RF and radiation exposure, especially those personnel who may be exposed to RF radiation above the permissible level.

REQUIREMENT:

All personnel with potential ionizing and non-ionizing radiation exposure, in accordance with OPNAVINST 5100.19B.

INTRODUCTION

Potential hazardous sources of ionizing and non-ionizing radiation exist aboard Navy ships. When using X-ray machines, radars, communications equipment, lasers, and microwave ovens aboard ship, there is a potential for personnel exposure to radiation. The Navy has a strict radiation, radiofrequency, and laser safety program to minimize radiation exposure. Nuclear power and nuclear weapon radiation protection programs are addressed in separate NAVSEA directives. They are not included under the NAVOSH program.

A. BACKGROUND

1. Radiation is energy transmitted through space in the form of electromagnetic waves ("rays") or nuclear particles.
 - a. Electromagnetic waves include:
 - (1) Radiofrequency radiation
 - (2) Microwaves
 - (3) Infrared, visible, and ultraviolet light
 - (4) X-rays and gamma rays
 - b. Nuclear particles include:
 - (1) Alpha particles
 - (2) Beta particles
 - (3) Neutrons
 - c. Ionizing radiation is radiation with sufficient energy to strip electrons from atoms in the media which it passes through. Alpha and beta particle neutrons, X-ray and gamma rays are ionizing radiation.
 - d. Non-ionizing radiation is less energetic radiation not capable of stripping electrons. It includes microwave, radio waves, visible light, infrared and ultraviolet light, and laser radiation.
 - e. Both types of radiation are potentially hazardous and both can cause serious occupational illness if exposures exceed acceptable limits.

B. IONIZING RADIATION

1. Radioactive material

- a. Besides nuclear weapons and nuclear propulsion materials, ships use small quantities of radioactive material in electron tubes, smoke detectors, compasses, luminous markers, and depth gages. Unless they are damaged and release radioactive material which could enter the body, they pose little hazard.

- (1) Other Navy directives cover nuclear weapons and nuclear propulsion radiological controls, use, storage, and disposal.

- b. Some missile and aircraft metal alloys contain thorium, which is only a hazard during cutting and grinding. Ship's crew members are prohibited from conducting these work practices.
- c. Some detection devices used in Chemical, Biological, and Radiological (CBR) warfare may have small radioactive sources associated with the instrument. They are enclosed and pose little hazard. All work on these meters must be done by tenders or shore repair facilities.

C. X-RAY RADIATION

- a. X-ray machines are found in Medical and Dental Departments in larger ships. The facilities are periodically surveyed and technicians monitored for their exposure levels with dosimeters. Precautions to protect patients from X-ray exposure are defined in medical directives.
- b. X-ray machines are used on tenders, repair ships and aircraft carriers for industrial radiography. These facilities are periodically inspected for compliance with procedures designed to ensure protection of technicians and other personnel.

- (1) Tenders and repair ships use different radioactive materials for industrial radiography. The radioactive sources may be used in fixed, shielded vaults on the tender, or as portable devices on the tended ship.

- (2) Strict radiological control procedures are implemented to ensure protection of technicians and other personnel.
- (3) Awareness of, and compliance with, warning signs and barriers marking exclusion areas where radiography is in progress is mandatory

D. NON-IONIZING RADIATION

1. Radar and communications equipment, specifically transmitters, may emit hazardous levels of radio-frequency (RF)/microwave radiation.
2. Exposure to RF/microwave radiation can cause biological effects due to heating of body tissue. It can also cause shocks and burns, premature activation of electro-explosive devices and arcs which could ignite nearby flammable material.
3. Transmitting antennas, radars, and heat sealing machine can emit RF/microwave radiation.
4. NAVSEA conducts surveys around antennas, radars and heat sealing machines to determine safe zones and danger zones. Red lines are used to mark unsafe areas and warning signs and labels must be posted at the access point to any area where the radiofrequency radiation (RFR) levels would exceed the permissible exposure limit (PEL).
5. Where the RFR levels may exceed 10 times the PEL, flashing lights, audible signals, and barriers may be needed to protect personnel.
6. Protective equipment is not authorized for routine protection against hazardous levels of RFR. This is considered a last resort type of protection. Electrically insulated gloves and shoes, for protection against shock and RF burns, may be used in special circumstances.

SHOW VIDEOTAPE "RADIOFREQUENCY RADIATION HEALTH HAZARDS," IF AVAILABLE.

E. LASERS

1. Lasers, used for optical systems, range finders, landing systems and communications equipment are becoming more common aboard ship.

2. The target organ for laser damage is the eye, which can suffer permanent or disabling injury from unprotected exposure. Some lasers and other light sources may also cause skin burns.
3. Every manufacturer labels and classifies their laser as to the hazard. The hazard classification determines the level of protection and precautions required.
4. Other intense optical light sources in the ultraviolet, visible and infrared regions have the potential to cause damage to the skin and the eyes. For example, germicidal lamps, phototherapy, sun and tanning lamps can cause damage.

SHOW VIDEOTAPE "LASER SAFETY," IF AVAILABLE.

E. THE NAVY'S RADIATION PROTECTION PROGRAM

1. The Navy's Radiation Protection Program consists of:
 - a. Identifying and evaluating radiation sources.
 - b. Using dosimetry to monitor exposure to ionizing radiation.
 - c. Medical surveillance.
 - d. Investigating and reporting radiation incidents.
 - e. Training.
2. The purpose of the program is to prevent personnel from exposure and monitor potential exposures. Medical surveillance is used to verify whether biological changes are occurring.

F. MEDICAL SURVEILLANCE

1. Surveillance consists of preplacement and periodic physical examinations.
2. The ionizing radiation exposure monitoring involves wearing a dosimeter and applies to all personnel having the potential for exposure.
3. RFR medical surveillance is required if the personnel work with RF equipment capable of creating an exposure greater than the permissible exposure levels given in the directives.

- a. The people receive a preplacement or baseline ex
 - b. Periodic exams are only required if the RFR leve
may have exceeded five times the PEL.
4. Laser medical surveillance is limited to those person
at risk of exposure to laser radiation.
 5. Separate directives tell medical personnel what tests
to conduct and what symptoms to be aware of with
these hazards.

DISCUSS THE SPECIFIC APPLICATIONS ABOARD YOUR SHIP.
NOTE WHERE RFR HAZARDS EXIST, WHAT RADIATION
SOURCES YOU HAVE ON BOARD, AND IF YOU HAVE LASERS.
IF YOU HAVE LASERS, TELL WHO THE LASER SAFETY
OFFICER IS AND EXPLAIN HIS OR HER DUTIES.

SUMMARY:

Ionizing and non-ionizing radiation hazards are present o
board all Navy ships. Special protection programs are well
established to cover nuclear propulsion and nuclear weapons
programs. The NAVOSH program manual implements a radiation
protection program to cover radiofrequency radiation, laser, a
ionizing radiation HAZARDS. Safety precautions and medical
surveillance help minimize personnel exposure.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.19B CHAPTER E
NAVMED P-5055- RADIATION HEALTH PROTECTION MANUAL, NAVSEA
3565 - ELECTROMAGNETIC RADIATION HAZARDS, AND NAVMEDCOMIN
6470.2 - LASER RADIATION HEALTH HAZARDS.

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY. QUIZ
ANSWER KEY IS PROVIDED.

RADIATION SAFETY/RADIOFREQUENCY HAZARDS PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER

1. X-rays are considered a non-ionizing radiation.
 - A. True
 - B. False
2. The radiation from a transmitting antenna can set-off an electro-explosive device nearby.
 - A. True
 - B. False
3. Unprotected exposure to radar transmissions can cause biological changes in the human body.
 - A. True
 - B. False
4. The NAVOSH Radiation Protection Program does not deal with
 - A. Radio waves.
 - B. Microwave transmissions.
 - C. Nuclear propulsion.
 - D. X-ray machines.
5. Red danger lines will be painted on the deck around antennas to define the hazardous area.
 - A. True
 - B. False
6. A transmitting antenna, giving off radiofrequency radiation, can:
 - A. Be a shock hazard.
 - B. Set up an arc.
 - C. Cause burns.
 - D. All of the above.

7. The target organ damaged by laser radiation is:

- A. Liver.
- B. Brain.
- C. Eyes.
- D. Lungs.

8. Infrared lights, arc lights and sun lamps give off ionizing radiation.

- A. True
- B. False

9. Medical surveillance periodically checks for exposure symptoms.

- A. True
- B. False

10. The only way to verify a radiofrequency radiation hazard exists is to have the radiation tested.

- A. True
- B. False

RADIATION/RADIOFREQUENCY HAZARD QUIZ KEY

1. B
2. A
3. A
4. C
5. A
6. D
7. C
8. B
9. A
10. A

LG #14

LESSON TOPIC: TRAFFIC SAFETY PROGRAM

AVERAGE TIME: 30 Minutes (add 30-60 minutes for videotapes)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.12 series
- b. OPNAVINST 5102.1 series

TRAINING AIDS:

- a. Videotapes - "Room to Live" (52568-DN) or "Deadliest Weapon In America" (606348-DN)
- b. Copy of OPNAVINST 5100.12 SERIES
- c. U.S. Navy Motor Vehicle Safety Resource Manual (available from the Naval Safety Center)
- d. Motorcycle and All Terrain Vehicle Resource Manual (available from the Naval Safety Center)
- e. Quiz

OBJECTIVES:

The student should understand the Navy has a Traffic Safety Program, to whom it applies; and the regulations pertaining to seat belts use and motorcycle safety, on- and off-base and on- and off-duty.

TARGET AUDIENCE:

All hands initial training with annual refreshers recommended. Additional training and courses are required for operators of emergency vehicles, buses, drivers at fault in a traffic accident involving government owned vehicles, traffic offenders driving privately-owned vehicles on base, and individuals who choose to ride a motorcycle. Also, all military personnel under the age of 26 shall receive a minimum of eight hours of traffic safety training.

REQUIREMENT:

Program indoctrination training is recommended. Annual refresher training on traffic safety is highly recommended especially around holidays. Formal driver education requirements are listed in OPNAVINST 5100.12 series enclosure (1).

INTRODUCTION:

For the last several years, motor vehicle mishaps have accounted for about 60 percent of the accidental deaths of Navy people. Many others suffer injuries preventing them from returning to the work force. The Navy's operational readiness depends upon its people and motor vehicle mishaps are degrading this readiness through needless loss due to death and injury. To combat this problem, the Navy has established a Traffic Safety Program.

A. BACKGROUND

1. The Navy is very concerned with the number of fatalities occurring to Navy people each year on the highways. The deaths have totaled over 200 people each year for the past ten years.
2. Department of Defense and Navy motor vehicles must conform to Federal Motor Vehicle Safety Standards. Tactical and combat vehicles must closely conform to Federal Motor Carrier Regulations.
3. Each Naval base must strive to meet Highway Safety Program Standards (HSPS). This includes marking of hazards, setting safe speed limits, adopting laws, and ensuring drivers are licensed.
4. The Navy is concerned with not only government owned motor vehicles, but with privately-owned automobiles, motorcycles, 4-wheel drive and recreational vehicles, mopeds, and all-terrain vehicles.
5. To protect Navy personnel, a Traffic Safety Program has been implemented Navy-wide. This program defines the safety precautions, laws and regulations governing the use of all vehicles by Navy people, on- and off-duty.
6. The Traffic Safety Program defines motor vehicles as wheeled vehicles designed for travel on public roads under motor power or assisted by motor power. They may be owned, leased, rented, or controlled by people as their private motor vehicle, or owned, leased, rented, or controlled by the government.
7. This program applies to all naval bases, stations, facilities, installations, detachments, and all other property under the jurisdiction of the U.S. Navy. Every command must designate, in writing, a Traffic Safety Program manager, including forces afloat.

B. APPLICABILITY

1. The Traffic Safety Program applies to motor vehicle operators, passengers, and pedestrians, including:
 - a. ALL Navy military personnel, ALL the time, both on- and off-base. Even off-duty driving across the sand dunes in your four-wheel-drive dune buggy, you must obey the rules in the Traffic Safety Program.
 - b. ALL Navy civilian personnel in a duty status, on- or off-base.
 - c. ALL people in, or on any Navy motor vehicle, on- or off-base.
 - d. All people on a naval base, anytime. This includes tourists coming onto base on a weekend to visit ships.
2. Non-compliance with certain parts of the Traffic Safety Program directive can result in courts martial under UCMJ, disciplinary action against civilian employees, or NJP for military people involved in minor violations.
3. The most important part of this violation criteria is: If you are injured as a result of violating a regulation, the violation may affect your compensation due to the injuries.
 - a. For example. You drive a friend's motorcycle on the base and aren't wearing the required protective equipment (such as an approved helmet and the proper shoes); or, you haven't attended the motorcycle safety course. You have an accident. The Navy may not pay your medical bills! If you die, your family may not get all your death benefits!
 - b. The Traffic Safety Program directive, OPNAVINST 5100.12 (series) authorizes disciplinary action for certain violations, such as seat belt rules and riding in the cargo areas of vehicles (in the back of a pick-up truck).
 - c. In some cases, the Navy's rules are stricter than most state or local laws.

C. SEAT BELT REGULATIONS

1. All Navy motor vehicles must be equipped with safety belts for the driver and all passengers.
 - a. Each person riding in, or operating a Navy motor vehicle must wear a safety belt.
 - b. If the vehicle does not have a safety belt at a seating position, no one can ride in that seat. Even if the vehicle is old and never had installed safety belts, you may not ride without a safety belt.
 - c. The only exception is buses not equipped with safety belts in passenger seating positions.
 - d. If the cargo area of a vehicle does not have safety belts installed, no one can ride in the cargo area of the vehicle. This means you may not catch a ride to the ship in the back of the pick-up or stake truck.
 - e. All children under age 4, weighing less than 40 pounds, SHALL USE an infant or child safety seat while riding in a Navy motor vehicle. States may have child safety seat laws which may differ slightly from Navy directives.
 - f. The operator of the vehicle is responsible for informing all passengers of the safety belt, child car safety seat, and protective equipment requirements of the Traffic Safety Program. That means you need to tell all your passengers to buckle up.
2. The rules are very similar for private vehicles.
 - a. All military personnel, on- and off-base, are required to wear a safety belt. This applies if you are the driver or passenger. If there is no safety belt installed, it's missing or damaged, you shall not ride in that seat. You can't ride in the cargo area of motor vehicles without safety belts.
 - b. All children under the age of 4, weighing less than 40 pounds SHALL USE an infant or child safety seat while riding in a private motor vehicle on any naval base. States may have child safety seat laws which may differ slightly from Navy directives.

- c. If you are driving on base, in your own car, you must inform all your passengers of these rules. If your passenger is injured in an accident, and wasn't wearing a seat belt, you may be liable.

D. PEDESTRIANS

1. When walking on roads and streets, always walk facing traffic. At night, carry a light or wear something white or reflective.
 - a. People working in roads or streets on the base are required to be issued and wear retro-reflective vests.
2. Jogging on roads or streets on-base during peak traffic periods, and at night is not authorized. People shall use sidewalks or jogging paths when they are available. If using the roadway, personnel shall:
 - a. Jog facing traffic.
 - b. Wear high visibility clothing.
 - c. Be cautious of cars entering the roadway from cross streets or driveways.
 - d. Obey traffic signals.
 - e. Never assume the right of way.
 - f. Do not dash across the roadway or in front of oncoming vehicles, since most drivers are on the lookout for other vehicles and not joggers.

E. PORTABLE HEADPHONES

1. The use of portable headphones, earphones, or other listening devices is restricted on roadways, sidewalks, and shoulders along roadways on base while:
 - a. Operating a motor vehicle
 - b. Jogging
 - c. Walking
 - d. Bicycling
 - e. Skating

2. This does not include hearing aids or hearing protective equipment worn by road workers.
3. You could end up with a ticket from the Base Police for jogging along the road wearing a WALKMAN.

F. MOTORCYCLES

1. The term motorcycle is used by the Navy to refer to all motorcycles, motorscooters, motorized bicycles, mopeds, and all terrain vehicles (ATVs).
2. Motorcycle mishaps result in some of the most serious injuries and fatalities among Navy personnel.
3. Every command must make sure people planning on operating a motorcycle attend the approved, Naval Safety Center motorcycle safety training course, whether they choose to ride their motorcycle on- or off-base.
 - a. The course is required before issuing a base sticker for the motorcycle.
 - b. A special course is available for ATV safety.
4. Motorcycle headlight(s) must be ON all times while operating the motorcycle.
5. These rules apply to military motorcycle drivers on- and off-base.
 - a. Every motorcycle operator and passenger must wear:
 - (1) A properly fastened, approved helmet.
 - (2) Impact resistant eye protection.
 - (3) Hard-soled shoes with heels.
 - b. Every motorcycle operator and passenger is encouraged to wear:
 - (1) Reflective tape on the helmets.
 - (2) Long-sleeved shirt or jacket, long trousers, or leathers.
 - (3) Full-finger leather gloves.
 - (4) Over-the-ankle shoes or boots.
 - (5) Retro-reflective vests.

6. The motorcycle operator must be licensed by a state to operate a motorcycle.

G. DRIVER EDUCATION

1. The Chief of Naval Education must provide all military people under the age of 26, having a driver's license or are required to operate a government motor vehicle, with a minimum of 8 hours of classroom instruction in driver safety.
2. The Naval Safety Center trains instructors for ships and commands wishing to provide traffic safety training. They use the Automobile Association of America training program.
 - a. You may be required to attend the course if you are found at fault in a motor vehicle violation while operating a government vehicle or driving your own car on the base.
3. People required to drive Navy police vehicles, ambulances, fire trucks and crash and rescue vehicles shall complete the National Highway Traffic Safety Administration's Emergency Vehicle Operator Course (EVOC).
4. Operators of school buses transporting dependent children must also attend special training.

G. MISHAP REPORTING

1. Every base shall establish a Traffic Safety Council. The Council monitors traffic mishaps, road networks, recommends new signs or signals, and generally remains aware of the base traffic situation.
2. All mishaps involving Navy vehicles must be reported in accordance with OPNAVINST 5102.1 series.
3. Private motor vehicle mishaps must be reported to the Naval Safety Center if they involve injuries resulting in more than one full lost work day, or result in government property damage of \$1,000 or more.
4. The reports are separate from the police and JAGMAN reports, or the investigations for claims. The Naval Safety Center mishap reports are used for safety purposes and data gathering only.

SHOW VIDEOTAPE "ROOM TO LIVE," IF AVAILABLE. ADD 60 MINUTES TO COURSE LENGTH. MANY OTHER VIDEOTAPES ON TRAFFIC SAFETY AND DRINKING AND DRIVING ARE LISTED IN THE FRONT OF THIS MANUAL.

SUMMARY:

The loss of military personnel because of motor vehicle mishaps impacts on Navy readiness. To protect both military and civilian Navy personnel, the Chief of Naval Operations has issued a Navy Traffic Safety Program directive. The directive contains strict rules and regulations pertaining to safety belts and motorcycle safety. Compliance with these regulations will be strictly enforced.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.12 SERIES AND THE NAVAL SAFETY CENTER.

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY. QUIZ KEY IS PROVIDED.

TRAFFIC SAFETY PROGRAM QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. The Navy's Traffic Safety Program regulations do not pertain to Navy military personnel in their own cars off-base.

- A. True
- B. False

2. If you ride a motorcycle off-base, you have to wear a helmet, even if your state does not have a helmet law.

- A. True
- B. False

3. The child car safety seat regulations regarding age and weight under the Navy's Traffic Safety Program may not apply off base.

- A. True
- B. False

4. Before you can get a base registration sticker for your motorcycle, you must:

- A. Get the motorcycle inspected by the base police.
- B. Buy an extra helmet.
- C. Complete the Navy-approved Motorcycle Safety Course.
- D. Purchase a leather jacket.

5. Not only can you be cited by the base police, but you can be put on report for UCMJ violations for not wearing your safety belt.

- A. True
- B. False

6. If you drive an older car, that never had safety belts installed, you are exempt from wearing them.

- A. True
- B. False

7. If there is a cap or cover on the back of a pick-up truck, you are allowed to ride in the cargo area.
- A. True
 - B. False
8. You are not allowed to wear a WALKMAN or headphone set while bicycling on streets around base.
- A. True
 - B. False
9. If you work in the road or streets on base you must wear:
- A. A white hard hat.
 - B. A leather jacket.
 - C. A retro-reflective vest.
 - D. Bright red suspenders.
10. Civilians visiting and driving around base are not covered by the Navy Traffic Safety Program.
- A. True
 - B. False

TRAFFIC SAFETY QUIZ KEY

1. B
2. A
3. A
4. C
5. A
6. B
7. B
8. A
9. C
10. B

LG #15

LESSON TOPIC: RECREATION, ATHLETICS AND HOME SAFETY

AVERAGE TIME: 30 Minutes (add about 20 minutes per videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.25 series
- b. OPNAVINST 5102.1 series

TRAINING AIDS:

- a. Videotape - "In a Fire Seconds Count" (22101-DN), "Must We Fall? - Slips, Trips and Falls" (504320-DN), "Physical Fitness and Sports" (803506-DN)
- b. Recreation, Athletics and Home Safety Resource Manual (available from Naval Safety Center)
- c. HANDOUT #1 - Recreation, Athletics and Home Safety Precautions
- d. Quiz

TERMINAL OBJECTIVES:

The student should be aware the Navy has a recreation, athletics and home safety program, the Navy is concerned with off-duty safety and mishaps, and the command has specific responsibilities for off-duty safety.

TARGET AUDIENCE:

All hands, including supervisors.

REQUIREMENT:

Initial and annual all hands training, in accordance with OPNAVINST 5100.25.

INTRODUCTION:

The Navy developed safety and occupational health programs to protect people from accidental death and injury. This includes mishaps occurring during recreational activities, athletics, and in the home. The Navy has a formal program dealing with recreational, athletics, and home safety, which all commands, ashore and afloat, must implement. More lost time and permanent loss due to injury mishaps occur off-duty than on-duty. To counter this, the Navy's program addresses awareness of home hazards, athletics safety and personal protection, and recreational area inspections.

A. BACKGROUND

1. The Navy's safety and health program is concerned with every member on active duty and, in some cases, their dependents.
 - a. The Department of Defense safety and health program covers military and civilian personnel. Military personnel are covered both on- and off-duty, on- and off-base.
 - b. Whether you are hurt on- or off-duty, the Navy still picks up the bill for your medical care, compensation, and death benefits.
2. Every year, about 2,500 Navy military people are accidentally injured or killed participating in recreation, athletics, and home activities. Injuries alone cost the Navy 30,000 workdays. For every on-duty mishap there is another off-the-job injury.
3. Additional losses in productivity occur when Navy people are required to be away from their command to care for family members hurt in mishaps.
4. Recreational mishaps are second only to motor vehicle mishaps as the leading cause of death for off-duty Navy personnel.
 - a. Drowning is the number one cause of death during recreation. About 20 drownings occur each year.
 - b. Overexertion and falls are the second and third leading causes of death respectively.
 - c. Team sports produce more dispensary visits and hospitalizations for injuries than any other recreational activity.

- d. Many recreational mishaps reports state alcohol was a contributing factor to the injury or death.
5. Athletics injuries can be prevented by better training and providing the proper protective equipment. Most athletic injuries result, for example, from poor conditioning and warm-up before the event, which training can help prevent.
6. Mishaps at home can frequently be prevented, such as children's poisonings, lawn mower mishaps, and fires. Whether it affects the sailor or the sailor's family, the Navy is still affected. A safe attitude on the job needs to extend to the home and off-duty hours.
7. Training in these topics can be just as important as any on-the-job safety training.
8. Nearly all of these mishaps are due to human error, such as lack of knowledge, inattention or distraction, or intentional violation of safe practices.
9. Hazard awareness training is necessary to overcome these deficiencies.

SHOW ANY OF THE LISTED VIDEOTAPES AVAILABLE. RECOMMEND "IN A FIRE SECONDS COUNT" ABOUT FIRES IN THE HOME.

B. THE NAVY RECREATION, ATHLETICS AND HOME SAFETY PROGRAM

1. The Navy issued a directive dealing with recreation, athletics and home safety in 1987 and updated it in 1990.
2. This directive, OPNAVINST 5100.25, established policy and procedures for implementing this program ashore and afloat.
3. The program applies to:
 - a. All military personnel on- or off-base.
 - b. Military dependents while on government property and while off-base participating in command-sponsored events.
 - c. On-duty civilian personnel during command sponsored athletic or recreational events on- or off-base, or while on TAD orders.

s you are covered during an off-base
ame as part of the ship's team or as a
spectator, while swimming in the base pool,
or your family as they watch you at the base
bowling alley.

4. Every command must implement this program and designate, in writing, a command program manager (usually the Special Services Officer). Our program manager is _____.
5. Each command must inspect and evaluate their recreational facilities and equipment annually. This includes shipboard gyms, workout and weight lifting areas, and game rooms. Ashore, it includes all the facilities run by fleet recreation and special services. Ships with enough athletic equipment to check out, such as volleyballs and basketballs must also have their procedures checked for safety.
 - a. Special services facilities checking out athletic equipment must ensure it is in good condition; and, if protective equipment is required for safe use, that the protective equipment is issued also.. For example, if the unit checks out racquetball rackets, they should also provide safety glasses.
 - b. Gym equipment should be checked for sharp edges, ensured that it is secured for sea, inspected for loose or worn parts, and for trip or obstruction hazards. Poorly made equipment, which may not stand up to heavy use, should be removed.
6. Personal protective equipment must be provide by the command for recreational and athletic activities.
 - a. Safety equipment must be provided with athletic gear.
 - b. Sight and hearing protection must be available for hobbies and auto repair work, recreational shooting, and archery.
 - c. Flotation devices must be available for boating and canoeing.
 - d. Commands can also provide reflective clothing for bicycling and jogging.

7. Training is an important part of this program.

- a. Hazard awareness and safety training is conducted to ensure individuals are aware of hazards, personal protective equipment requirements, and procedures for protecting themselves in the recreation, athletics and home environment.
- b. Training should be seasonally and geographically appropriate, and offered just prior to, or during those times of the year when personnel are at risk. Training is required at least quarterly.
- c. Traffic safety training is covered under a separate Navy instruction and program.
- d. Training information is available from many sources, including local fire departments, poison control centers, recreational services centers, and the Naval Safety Center.
- e. Commands must maintain all training records for two years.
- f. They can accomplish the training through Plan Of the Day (POD) Notes, posters, stand-up lectures, athletic team training, and the use of videotapes.

C. TRAINING TOPICS

- 1. Some of the training topics which should be covered each year include:
 - a. Recreation
 - (1) Bicycling
 - (2) Water sports
 - (3) Firearms
 - (4) Jogging
 - (5) Physical fitness
 - b. Athletics
 - (1) Basketball (responsible for the most lost time of any sport!)
 - (2) Football
 - (3) Racquetball
 - (4) Softball

c. Home safety

- (1) Child safety
- (2) Electrical safety
- (3) Fire safety
- (4) Poison prevention
- (5) Slips and falls

d. Substance abuse

HANDOUT #1 PROVIDES SHORT SUMMARIES OF THE RECREATIONAL, ATHLETICS AND HOME SAFETY PRECAUTIONS. DISTRIBUTE AND DISCUSS.

2. Some of these topics could even be presented at Spouse Club meetings and during Dependent's Cruises.

THE NAVAL SAFETY CENTER HAS DISTRIBUTED THE RECREATION, ATHLETICS AND HOME SAFETY RESOURCE MANUAL. THIS MANUAL HAS A VARIETY OF TOPIC SPECIFIC TRAINING AIDS, BULLETINS AND FACT SHEETS. THESE CAN BE USED TO DEVELOP LECTURES ON ANY OF THE ABOVE TOPICS.

D. REPORTING OF MISHAPS

1. Off-duty recreational, athletic, and home or hobby injuries are reportable mishaps, if they cause lost work time, permanent disability or death. OPNAVINST 5102.1 (series) addresses the circumstances requiring mishap reports.
 - a. Mishaps resulting in more than one full day's work lost, death, or permanent loss to the command due to injury must be reported to the Naval Safety Center within 20 days of occurrence.
 - b. Fatalities of military dependents which occur on government property, or in conjunction with command-sponsored events off government property, must also be reported.
2. The Naval Safety Center gathers mishap data to help in accident and injury prevention.

SUMMARY:

Each year, about 2,500 Navy military personnel engaged in recreation, athletics or other off-duty activities are accidentally injured or killed. These mishaps cost the Navy about 30,000 work days lost each year and about 10 million dollars. For every on-duty lost time mishap there is another military person who is injured off-the-job. Many of these mishaps are preventable. The key to prevention is training, for which the Navy has established a formal Recreation, Athletic and Home Safety Program.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.25 AND THE NAVAL SAFETY CENTER RECREATION, ATHLETICS AND HOME SAFETY RESOURCE MANUAL. IF YOU DO NOT HAVE A COPY AVAILABLE, YOU MAY REQUEST A COPY BE SENT TO YOUR COMMAND BY PHONING COMMERCIAL (804) 444-5748 OR AUTOVON 564-5748.

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY. QUIZ KEY IS PROVIDED.

RECREATIONAL, ATHLETICS AND HOME SAFETY PRECAUTIONS

RECREATION

1. SWIMMING:

Drowning is the number one cause of recreation, athletics, or home deaths.

About 45% of all drownings involve people falling in the water while walking on piers and bridges, or falling overboard while fishing.

Many victims are poor swimmers who lack basic water skills.

Know how to swim, always swim with a friend, and swim in designated areas with lifeguards.

Beware of cold water. Chances of survival in 50 degree water are only 50 - 50, if exposed for 50 minutes. Huddle to conserve heat.

Don't drink and swim. Alcohol dilates the blood vessels and cause faster heat loss. It also impairs judgement and increases risk-taking.

Look before you dive! Shallow water dives could leave you paralyzed for life.

2. OPEN WATER SCUBA AND CAVE DIVING:

Almost every year, two Navy service members drown while open water scuba and cave diving.

The main reason is lack of training and certification.

Proper certification is absolutely essential to diving safely.

Open water scuba diving certification does not qualify a person for cave or cavern diving.

Many bases sponsor diving certification courses.

3. BOATING:

The overwhelming majority of boat operators involved in fatal accidents have never taken a safe boating course.

About 50 percent of all boating accidents with serious injury are related to alcohol.

Operating a boat while intoxicated, with a blood alcohol content of 0.10 percent or more, carries a \$1,000 civil penalty and criminal penalty of up to \$5,000, one year in jail, or both.

Collisions or people falling overboard cause most boating injuries. Ninety percent who drowned were not wearing a personal flotation device (PFD).

Prior to boating, take a safe boating course. Don't drink and go boating.

Require everyone to wear a PFD while underway.

Leave a float plan with a friend, including the boat number, where you are going, when you expect to return, and when they should contact the Coast Guard.

To water ski safely requires three people: the skier, the boat operator and an observer who knows all the proper hand signals. Showing off is the chief cause of water skiing accidents.

4. SMALL ARMS AND HUNTING SAFETY:

The misuse of small arms has resulted in numerous accidents causing serious and fatal injuries to Navy personnel.

Twenty-five people are wounded every year, mostly with guns they thought were unloaded.

A Hunter Safety Course can provide the fundamentals of basic firearms safety.

Thirty-nine states require hunters to take this course before being licensed. They also require hunters to wear blaze orange clothing during deer season.

Always separate guns from ammunition stored in the home. The state of Florida requires all home owners with guns to store ammunition separately to reduce the chance of children discharging the guns.

5. PHYSICAL FITNESS:

Once people realize they are out of shape and want to do something about it, they usually try to get back into shape too rapidly.

Good physical fitness can pay off, if done carefully and consistently. Exercising only once per week can do more damage than good.

You must exercise about 30 minutes per session, at least twice a week. You need to exercise three or four times a week to improve your level of fitness.

Allow 10 - 15 minutes for warm-ups before and after your routine.

Watch for the "heat stress monster" when working out during hot or humid weather. Drink plenty of water before, during, and after exercise to avoid dehydration.

6. BICYCLING/JOGGING:

Over 50% of bicycle accidents result in head injuries, including skull and face fractures and concussions.

The impact of a rider's head against a sidewalk from a 10 speed bike going 25 mph is as great as a motorcyclist being thrown from his vehicle at the same speed.

You can protect yourself from serious injury by wearing an ANSI or Snell approved bicycle safety helmet.

Joggers and bicyclists are required to wear light colored, reflective clothing during low visibility hours, such as dusk, dawn, and during fog or rain.

The safest place to jog or bike is on an established jogging or biking path.

It is recommended that joggers run against traffic flow and bicyclists ride with traffic flow, if streets are used.

While using streets or roads, joggers, bicyclists, and skaters shall not wear portable listening devices for entertainment.

ATHLETICS

Athletics provide a basic physical conditioning process through which the Navy can help build and maintain an effective fighting force.

Some athletic events, however, have inherent risks for participants. Padding and protective equipment can help reduce injuries and are mandatory for some sponsored team sports.

Alcohol should never be consumed prior to, or during any game or practice.

If you get a sprain, remember "RICE" - REST it; put ICE on it; wrap something around the injury to COMPRESS it; and ELEVATE that part of the body. Seek medical attention if you experience loss of movement of a limb, a locked joint, persistent swelling, or a grinding feeling.

1. SOFTBALL

The most serious accidents associated with softball are from sliding and collisions. One ship deployed to the Med reported numerous sliding injuries at a Navy recreation park in Italy, where the bases had been well anchored to prevent loss. They finally established a no-sliding rule!

Communication is very important to avoid collisions among teammates. In 1989, a highly skilled Navy technician collided with another player while going for a fly ball. He never recovered from the impact and eventually died.

Before the game, designate the center fielder to call off teammates for outfield fly balls, and the shortstop for infield fly balls.

2. TOUCH/FLAG FOOTBALL

Some people think touch or flag football is safe because no one is required to wear pads and helmets. However, what starts as a friendly game often turns into a rough game of tackle.

The shoulder block is the only legal block in touch and flag football. It is done between the waist and shoulder with both feet contacting the ground at the moment of contact.

To prevent collisions, a fumbled football should be left lying on the ground, because it may not be legally advanced by either team. It belongs to the team that last had possession.

3. BASKETBALL

Many basketball injuries result from improper warm-up, the wrong type shoes, and playing too aggressively.

High top basketball shoes can minimize ankle injuries and provide better support.

Aviod tactics such as pushing and tripping.

Setting up basketball courts on flight and hanger decks provide recreation at sea, but can cause serious injuries when trying to twist and pivot, or if someone falls, on non-skid decking.

4. RACQUETBALL

Most injuries from racquetball occur when players use lensless eye protection, or no eye protection at all.

A racquetball usually travels at 80 mph when hit and compresses into the shape of a sphere.

If it strikes a lensless goggle it can penetrate the opening and hit the eye.

Wraparound impact resistant eye protectors with lenses are required to be worn.

Navy recreational equipment issuers must also provide eye protection with racquetball rackets.

HOME SAFETY

1. FALLS:

The majority of home accidents involve falls. Most people fall on the same level and not from higher places.

The most common sources of injury are: slipping on small scatter rugs, walking on highly polished or wet floors, tripping on upturned or torn carpets, dark stairways, and standing on chairs to extend one's reach.

Bathtub and shower falls have decreased over the last 25 years due to antislip bath mats, stick-on appliques, and manufacturer applied slip-proofing.

2. FIRES:

Most home fires result from unattended cooking, careless smoking habits, overloaded electrical circuits, and children playing with matches.

Having a smoke detector can save lives. Check the batteries at least once a year.

Conduct a fire prevention check of your home or apartment. Keep matches and lighters out of children's reach.

Have a plan of action for escape and conduct a drill.

3. CHILDREN:

More children die each year from preventable injuries than from all childhood diseases.

Five major causes of accidental death are:

- Traffic accidents
- Drownings
- Falls
- Choking
- Poisonings/burns

The National Safe Kids Campaign is a nation-wide effort designed to eliminate these accidents through parental education and improvement of national safety codes and standards.

RECREATION, ATHLETICS AND HOME SAFETY PROGRAM QUIZ

RATE/ NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. Each command must designate, in writing, a Recreation, Athletics and Home Safety Program manager.

- A. True
- B. False

2. Military personnel loose the most work time each year from what sport?

- A. Football
- B. Basketball
- C. Tennis
- D. Golf
- E. Softball

3. Traffic and seat belt safety are included in the Recreation, Athletics and Home Safety Program.

- A. True
- B. False

4. Military dependents are not included in the Navy's Recreation, Athletic and Home Safety Program.

- A. True
- B. False

5. If the command issues athletic equipment, they must also issue the protective equipment required with that equipment.

- A. True
- B. False

6. Safety and hazard awareness training on recreation, athletics or home safety topics must be given:

- A. Every two years.
- B. Quarterly, prior to or during the times of year when personnel are at risk.
- C. Annually.
- D. Monthly.
- E. Only if the command is participating in a team sport.

7. Only on-duty mishaps, resulting in fatalities or more than one lost work day, must be reported.
- A. True
 - B. False
8. The ship's gym must be inspected at least annually for safety hazards.
- A. True
 - B. False
9. Which of the following topics are recommended for training on board ship?
- A. Child safety
 - B. Jogging safety
 - C. Poison prevention
 - D. Hunting safety
 - E. All of the above
10. Most of the injuries resulting from athletics are caused by:
- A. Poor conditioning and no warm-up.
 - B. Lack of supervision.
 - C. Loose clothing.
 - D. Not following game rules.
 - E. Lack of command sponsorship.

RECREATION, ATHLETICS AND HOME SAFETY QUIZ KEY

1. A
2. B
3. B
4. B
5. A
6. B
7. A
8. A
9. E
10. A

LG #16

LESSON TOPIC: HAZARDOUS MATERIAL SPILL RESPONSE/DRILL

AVERAGE TIME: 60 Minutes (Add 18 minutes for the videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B3, Appendix B3-A
- b. DoT Emergency Response Guidebook (if available)
- c. OPNAVINST 5090.1A, Chapter 17- Pollution Abatement Afloat

TRAINING AIDS:

- a. Handout #1 - Hazardous Material Spill Response Procedures (OPNAVINST 5100.19B Appendix B3-A)
- b. Videotape - "Shipboard Hazardous Material Spill Response and Clean-up" (803492-DN)
- c. Repair locker materials and protective clothing from chemical handling areas or Hazardous Material Spill Response Kit, if available
- d. DCTT spill scenarios

OBJECTIVES:

The student should understand the special response procedures necessary to handle hazardous materials spills. The student should be able to demonstrate, or observe, response personnel donning protective equipment and cleaning-up a simulated hazardous material spill.

TARGET AUDIENCE:

All fire parties, damage control personnel, fire marshals, gas free engineers, and gas free petty officers, rescue and assistance details, and Command Duty Officers.

REQUIREMENT:

Initial and annual training, with drill, in accordance with OPNAVINST 5100.19B.

INTRODUCTION

There are enough hazards associated with handling hazardous materials under a controlled situation, much less under a spill or emergency situation. A hazardous material spill can be a threat to the safety of the ship, the environment, and personnel. Users can usually handle small spills, less than five gallons of low toxicity material. Material Safety Data Sheets (MSDSs) provide spill clean-up information. Larger spills of highly toxic, flammable, or explosive material can cause extensive damage to the ship and personnel injury. As with any threat to the ship, damage control teams are tasked with responding and handling the emergency.

A. BACKGROUND

1. The Navy has established the Hazardous Material/Hazardous Waste program to provide the precautions and procedures to safely handle these materials.
2. Steps must be taken to prevent hazardous material spills from occurring.
 - a. The HM/HW Coordinator, along with the DCA, pinpoint those places aboard ship which are potential spill areas.
 - b. These areas include storerooms, stores handling elevators and conveyors, crane handling areas, in-use storage areas, sumps and tanks, and certain evolutions, such as UNREP/RAS, when spills may occur.
 - c. Periodic checking of these areas, especially after heavy weather, may alert you to a spill.
 - d. Environmental contamination of navigable waterways must be prevented.
3. Spillage, or accidental release, of hazardous materials must be handled with the proper protective clothing and with the correct procedures to avoid personnel injury and damage to the ship.
 - a. Damage control personnel, CDO's, fire marshals, gas free personnel, and the DCA must be trained in spill response.
 - b. An annual drill must be conducted in spill response.

- c. Each member of the damage control team must be aware of the potential hazards of hazardous material spills and they must handle each spill as a special case. The DCA, CDO, or fire marshal will evaluate the spill and instruct team members in clean-up procedures.
- d. Spills of oil, OTTO fuel, PCBs, radioactive material, mercury, CHT, and hydraulic fluid are handled by separate instructions. Specialized spill kits are available for each of these items, and trained spill teams generally respond to these types of spills.
- e. Damage control personnel may be called upon to respond to spills of paint, thinner, dry cleaning fluid, lube oil, acid, boiler water feed water chemicals, and laundry products.

SHOW VIDEOTAPE "SHIPBOARD HAZARDOUS MATERIAL SPILL RESPONSE AND CLEAN-UP," IF AVAILABLE.

B. PHASES OF SPILL RESPONSE

DISTRIBUTE HANDOUT #1 - SPILL RESPONSE PROCEDURES

- 1. As you can see on your handout, there are nine phases of spill response. They are similar to every damage control response, such as fire, flooding, or toxic gas.
- 2. These phases do not always occur in order, and some may occur simultaneously.
- 3. The phases are:
 - a. Discovery and notification.
 - b. Initiation of action.
 - c. Evaluation.
 - d. Containment and damage control.
 - e. Dispersion of gases and vapors.
 - f. Clean-up and decontamination

- g. Disposal of contaminated materials
- h. Certification for re-entry
- i. Follow-up reports

C. SPILL DISCOVERY AND NOTIFICATION

1. Spills are discovered during zone inspections, by detection devices such as alarms, during routine operations, or safety surveys.
2. Early detection is critical. Leaking boxes, the sound of broken glass, seepage around barrel rims, unusual odors, or missing caps can be indicators of a spill.
3. Anyone can discover a spill. Everyone should be trained to notify their supervisor as soon as they discover a spill.
 - a. NEVER touch the spilled material.
 - b. Evacuate the area and keep passersby from entering the spill site.
 - c. If the situation is a severe hazard, or if you cannot reach your supervisor, contact Damage Control Central or the Quarterdeck.
 - d. The person reporting the spill should report the same type of information you would report in case of fire or flooding:
 - (1) Time of discovery or spill.
 - (2) Location of the spill, by compartment name and compartment number.
 - (3) Type of material spilled, if known.
 - (4) Behavior of the material- is it heading for a deck drain, is it giving off thick red gas, is it still spilling out of it's container, for example.
 - (5) Source of the spill, such as a 55 gallon drum, 5 gallon can, tank, pipe, etc.
 - (6) Any personnel injuries or witnesses.

- (7) How much material is spilled, how many gallons, how many square feet on the deck.
- e. Damage Control Central needs as much information as possible to decide who to send to the scene.
- f. For example, a five gallon can of paint thinner was dropped down a ladder near the storeroom. The can burst open when it hit the deck. The vestibule has no ventilation and the flammable vapors are building. In responding to this spill, the DCA may want to send the entire fire party with charged fire hoses to the scene. The DCA needs all the above information to make the decision.

D. INITIATION OF ACTION

1. The most important initial actions are to evacuate personnel, secure power to the affected area (if a flammable), and call away a medical emergency for any injured personnel.
2. Cordon off the area until help arrives.
3. The DCA, CDO, fire marshal, repair locker leader, scene leader, or other authority will stabilize the situation before thinking about the clean-up. This may include securing deck drains, securing ventilation, setting spill boundaries, and staging back-up personnel.
4. Once the situation is stable, injured personnel have been rescued and cared for, there is no threat of immediate fire or explosion, then authorities can consider the next step.

E. EVALUATION

1. The Medical Department Representative and the HM/HW Coordinator must have a Material Safety Data Sheet (MSDS) for every hazardous material held on board. The CDO's, DCA, fire marshals, and key players should know where these MSDSs are located and how to use them.
2. MSDS's provide specific spill and hazard information for the spilled item. The MSDS will tell if the item is corrosive, gives off toxic gases, or reacts with nearby substances, for example.

3. In trying to decide how to handle and clean-up the spill, the MSDS information becomes critical.
4. Part of this evaluation took place during the initiation of action phase. The remainder may take place during the next phase of containment and damage control.

F. CONTAINMENT AND DAMAGE CONTROL

1. During this phase, the CDO, DCA, fire marshal or scene leader would decide if a Red Devil blower were needed for ventilation, and if any further damage control actions, beyond the initial action, is needed.
2. The decision would be made, based on the MSDS, what type of protective equipment would be needed and who will dress out to approach the spill.
3. Barriers of sand, absorbent, blankets, or paper toweling may be placed around the spill to prevent spread.
4. The Gas Free Engineering Petty Officer may be required to determine explosive levels and levels of toxic gas.

G. DISPERSION OF GASES

1. Ventilation from the surrounding area, a Red Devil Blower, LAMAIR mover, or local exhaust may be used to reduce explosive levels, disperse or dilute air contaminants.
2. Care needs to be taken when exhausting vapors and gases to weather to prevent re-introducing them into the ship.
3. The Gas Free Engineering Petty Officer uses meters and draeger tubes to check for ventilation effectiveness.

H. CLEAN-UP AND DECONTAMINATION

1. Once the initial phases are complete, the team can take its time cleaning up the spill and decontaminating the area.
 - a. Clean-up personnel will be appointed and supervised as they don the required protective clothing.
 - b. Protective clothing is provided in each ship's Spill Clean-up Kit, kept in or near a Repair Locker.

IF YOUR SHIP HAS THE SPILL CLEAN-UP KIT AVAILABLE,
BREAK OUT THE KIT AND SHOW ALL THE COMPONENTS TO THE
STUDENTS. EXPLAIN THE USE OF EACH ITEM.

- c. One person will conduct the clean-up while the other assists. They may trade off.
- d. The DCA, CDO, fire marshal or scene leader will decide what protective clothing is required and instruct the team members in the clean-up.

I. DISPOSAL OF CONTAMINATED MATERIALS

- 1. All the spilled material, absorbent, disposable clothing contaminated with the spilled material, and items which cannot be decontaminated are considered hazardous waste.
 - a. These items must be double bagged in plastic or placed in a empty drum or barrel and sealed.
 - b. The waste must be labeled with a hazardous waste label.
 - c. The waste must then be turned over to the Supply Department for disposal.
- 2. You must decontaminate reusable items, such as rubber boots, dustpans, brooms, and mops before reuse. Place them in a doubled plastic bag until you can accomplish the decontamination. The Safety Officer or HM/HW Coordinator will help decide how to safely decontaminate reusable spill equipment.

J. CERTIFICATION FOR SAFE RE-ENTRY

- 1. Once the decontamination is completed, the CDO, DCA, or fire marshal will inspect the area to ensure the clean-up is complete.
- 2. If toxic gases or vapors were involved, the area may need to be cleared by the Gas-Free Engineer.

K. FOLLOW-UP REPORTS

- 1. The spill response should be logged in the Damage Control Central log, and the OOD's Deck Log.

2. The CDO may want a written report to present to the CO or XO. Give a copy of this memo to the HM/HW Coordinator.
3. If there was local press interest, or if the spill caused fatalities or excessive damage, an OPREP-3 is probably required. Spills, such as oil, mercury, and PCBs have their own reporting requirements.
 - (1) OPNAVINST 5090.1A provides hazardous materials spill response and reporting procedures for spills over the side, in Navy, non-Navy and Foreign ports. Report formats are provided.
 - (2) Any environmentally significant spill requires an OPREP-3 report.
4. Mishap reports to the Naval Safety Center are only required if the hazardous material exposure required medical treatment, resulted in one entire lost work day or caused a death.

K. HAZARDOUS MATERIAL SPILL DRILLS

1. Hazardous material spill drills are to be conducted at least annually. These drills are in addition to already required mercury spill drills, OTTO fuel spill drills, and others required by separate directives.
2. The drill should be realistic for our class and type of ship.
3. The Damage Control Training Team (DCTT) will develop spill drill scenarios involving the entire fire party.

SUMMARY:

Hazardous material spills may become damage control situations that threaten the ship and personnel. Damage control parties must be aware that, although similar to other damage control situations, spills may require special handling and precautions because of the chemical involved. Damage control personnel must be trained and drilled to understand hazardous material spill response procedures.

FOR MORE INFORMATION CONSULT OPNAVINST 5100.19B, APPENDIX B3-A.

SPILL RESPONSE SCENARIOS ARE PROVIDED. SELECT ONE, FOR A HAZARDOUS MATERIAL FREQUENTLY USED ON BOARD (MSDS AVAILABLE) OR DEVELOP YOUR OWN DRILL.

HAZARDOUS MATERIAL/HAZARDOUS WASTE SPILL RESPONSE PROCEDURES

a. Introduction. Because of the extremely hazardous nature of many materials used aboard ships, only trained personnel shall respond to a hazardous material/hazardous waste (HM/HW) spill. Personnel shall be trained by division officers or supervisory personnel to clean up small spills of HM/HW. Appropriate Material Safety Data Sheets (MSDS) shall be used to conduct training.

For descriptive purposes, the spill response procedures have been divided into nine phases:

- (1) Discovery and Notification.
- (2) Initiation of Action.
- (3) Evaluation.
- (4) Containment and Damage Control.
- (5) Dispersion of Gases/Vapors.
- (6) Cleanup and Decontamination.
- (7) Disposal of Contaminated Materials.
- (8) Certification for Re-entry.
- (9) Follow-up Reports.

Each response phase is not a separate response action entirely independent of all other phases. Several phases may occur simultaneously and may involve common elements in their operation. For example, containment and damage control may also involve cleanup and disposal techniques.

b. Spill Discovery and Notification

(1) Spills or potential spills of hazardous substances may be discovered by regularly scheduled inspections of storerooms and workshops, by detection devices such as fire alarms and oxygen deficiency detectors, and during routine operations. All discoveries of spills or situations that may lead to a spill shall be verbally reported immediately to supervisory personnel and the OOD/CDO. Crew members are not to remain in the area to investigate the spill. Whenever possible, however, the discoverer/initial response team shall report the following information:

- (a) Time of spill discovery.
- (b) Location of spill.
- (c) Identification of spilled material.
- (d) Behavior of material (reactions observed).
- (e) Source of spill (e.g., tank, container).
- (f) Personnel in vicinity of spill (list by name and department).
- (g) Volume of spill.
- (h) Anticipated movement of spill (e.g., leakage to lower deck passage from midships toward galley).
- (i) Labeling or placarding information (copy data from spilled container only after exposure to spill is eliminated).

(2) The commanding officer shall report all overboard spills of hazardous substances as required by OPNAVINST 5090.1A, "Navy Environmental and Natural Resources Program Manual."

c. Initiation of Action. Coordination and direction of spill response efforts at the scene of an HM/HW spill shall be accomplished by the ship's officer of the deck (OOD), command duty officer (CDO), fire chief, damage control party leader, or senior person at the scene, as appropriate, who shall initiate the following actions:

- (1) Evacuate all personnel from areas that may be exposed to the spilled material, especially to vapors.
- (2) Cordon off the affected area.
- (3) Arrange first aid for injured personnel.

CAUTION

Do not enter the contaminated area until the necessary protective clothing and equipment have been determined (See Section d).

- (4) Establish a command post and communications network.
- (5) Prevent spills from entering other compartments by any means that do not involve personnel exposure to the spill such as closing drains, ventilation ducts, doors, and hatches.

(6) Disperse gases or vapors to weather through the use of blow-out (forced exhaust) ventilation or by natural ventilation such as opening doors or hatches. If atmosphere is suspected to be flammable or explosive, only explosion-proof fans shall be used for blow-out ventilation.

(7) Eliminate any fire or explosion hazards such as electrical equipment, incompatible materials, and open flames.

d. Evaluation. Proper evaluation of a spill can prevent fires, explosions, personal injury, or permit steps to lessen their impact. This evaluation consists of the following three steps:

(1) Obtain as much of the following information as possible from container labels and material safety data sheets (MSDS) before commencing further response actions:

(a) Type and concentration of the spilled material.

(b) Hazardous characteristics of the spilled material, such as:

1. Flash Point

2. Toxicity

3. Corrosiveness

4. Potentially incompatible substances

5. Effects resulting from exposure
(fainting, dizziness, skin or eye irritation, nausea)

6. First aid measures for exposure

(2) Determine dangerous conditions or potential consequences of the spill, including:

(a) Fire or explosion.

(b) Presence of oxygen-deficient atmosphere in compartment.

(c) Presence of toxic or explosive gases.

(d) Possibility of dangerous vapors being drawn into ship's ventilating system.

(e) Other HM/HW in compartment that would play a role in a fire or explosion or is incompatible with the spilled material.

(3) Determine from the MSDS the appropriate spill response equipment and protective clothing necessary for safe and effective response.

e. Containment and Damage Control. Actions taken during this phase are directed toward controlling the immediate spread of the spill and minimizing the impact to the ship and crew. Depending on the type of spill, some or all of the following procedures may be employed:

(1) Fight fire (if any), being careful to use firefighting methods compatible with the material involved.

(2) Shut off or otherwise stem the spill at its source, whenever feasible, by:

(a) Replacing leaking containers.

(b) Plugging leaks in tanks.

(c) Emptying tank of remaining contents.

(d) Encapsulating a leaking container into a larger, liquid-tight container.

(3) Predict spill movement and take further action to prevent the spill from possibly entering other compartments by closing scuppers, drains, ventilation ducts, doors, or hatches.

(4) Contain liquid material using barriers, such as sand, upholstery, sorbents, or other equipment suitable to dam the flow.

f. Dispersion of Gas/Vapor. If a flammable gas or vapor is released as a result of the spill, the gas/vapor shall be dispersed or diluted as soon as possible. The gas/vapor shall not be allowed to enter other compartments. In some cases, the explosive atmosphere shall be contained and diluted to lower its concentration below the Lower Explosive Limit (LEL). Have the gas free engineer check the spill area for LEL and toxicity. The atmosphere can then be dispersed by one of the following methods:

(1) Normal exhaust ventilation (explosion-proof only).

(2) Blow-out ventilation (powerful exhaust ventilation provided in some HM storerooms--explosion-proof only).

(3) Doors and hatches open to the weather.

(4) Portable fans (explosion-proof only).

g. Clean-up and Decontamination. During this response phase, personnel, as directed by the person in charge, shall employ the spill clean-up methods recommended on the MSDS. All surfaces shall be thoroughly cleaned of the spilled material. After the spill clean-up, the compartment shall be thoroughly ventilated. Reusable protective clothing shall be thoroughly decontaminated and otherwise maintained before it is returned to its proper storage location.

h. Disposal of Contaminated Materials. All non-reusable cleanup materials are to be placed in impermeable containers, stored and disposed of as hazardous waste in accordance with Appendix B3-C. These materials include unrecoverable protective clothing, sorbents, rags, brooms, and containers.

i. Certification for Safe Re-Entry. The spaces affected by the spill shall be certified safe by the OOD/CDO before normal shipboard operations are resumed in that space. The OOD/CDO shall ascertain the following before allowing re-entry:

(1) All surfaces--deck, counters, bulkheads, overheads--have been thoroughly cleaned of the spilled material.

(2) All compartments have been adequately ventilated as determined from analysis by the gas free engineer.

(3) All contaminated clean-up materials, including protective clothing, have been packaged, marked and handled as HMTID.

j. Follow-up Reports. The OOD/CDO shall submit to the HM/HW coordinator a spill report for all on board spills. A copy of this report shall be filed by the Safety Officer and shall contain the following information:

(1) Date spill occurred.

(2) Spill location.

(3) Identity of spilled material.

(4) Cause(s) of spill.

(5) Damage or injuries resulting from the spill.

(6) Response and clean-up measures taken.

(7) Any problems encountered.

(8) Method of disposing of contaminated material.

(9) Action taken to prevent the repeat of a similar spill.

HAZARDOUS MATERIAL SPILL RESPONSE DRILL SCENARIOS

The following sample hazardous material spill response drill scenarios have been collected from several ships. The DCTT should review and discuss these scenarios for applicability to your ship. Each drill should involve as many actions as possible. Walk through the scenario first to train personnel before conducting a complete drill. Each duty section and all CDOs and fire marshals should observe or participate in a hazardous material spill drill. If available, use your ship's spill response kit.

SCENARIO #1

An Engineman is removing a 12 volt battery from the motor whale boat. The boat is on the davit, and the Engineman must carry the battery down the side ladder. As he lifts the battery over to the side of the boat, his glove slips, and the battery falls about 10 feet to the deck below. The battery caps fly off and about half a gallon of battery acid spills on the deck. The acid is flowing toward the deck edge and scupper over the side. A nearby Boatswain's mate tries to set the battery up to stop the spill and suffers acid burns on his hands.

This spill will involve:

A medical emergency for acid burns.

Stopping the spill from spreading.

Using baking soda to neutralize the acid around the battery, and using protective equipment to pick it up and bag it as waste.

Spreading baking powder and scrubbing the spill area.

Fireparty to charge hoses and dilute the acid while washing it over the side.

Protective equipment would include rubber boots, rubber gloves, a rubber apron, and goggles. A respirator would not be required.

The hazardous waste would include the broken battery and any contaminated containment materials.

The acid spill should be neutralized before washing it over the side. The alternative is to neutralize with baking soda and absorbing it up with towels, absorbent, or other material. All this would be bagged as hazardous waste.

SCENARIO #2

An SK3 went down to the flammable liquid storeroom to break out a five gallon can of paint thinner (flash point less than 100 degrees). As he carries this can up the ladder, the handle breaks off the can, and it falls down to the bottom of the ladder. As the can hits, the cap pops off and the contents spill. The vestibule is small and there is no ventilation in the ladderwell. The SK3 tries to go down after the can, and while trying to right the can and replace the cap, falls unconscious into the thinner. A sailor in a space above smells the strong vapors and phones DC Central to get the fire marshal to investigate. The sailor and the fire marshal find the unconscious SK3 and see the spilled paint thinner in the vestibule.

This spill would involve:

Explosive vapors and the need to secure sources of ignition.

A medical emergency with the SK3 overcome by the vapors and skin contact with the chemical. A rescue would require respiratory protection but not an OBA due to flammable vapors.

Ventilating the area with a Red Devil Blower.

Calling away the fire party in case of explosion and fire.

Gas-freeing the area.

Dressing out two people in goggles, organic vapor respirators, rubber boots, rubber gloves, and disposable coveralls.

Cleaning up the spill using absorbent, double plastic bagging, and marking the material as hazardous waste.

Decontamination of the area with soapy water.

Other scenarios could include a crane delivering a pallet load of paint breaking over the helo deck and spilling; several 5 gallon cans of ammonia floor wax stripper breaking free during heavy weather and spilling in a berthing area; and a 50 pound container of powdered citric acid falling in the engineroom and breaking open, spilling the powder into the bilges and over two levels of deck grating. Be creative, but realistic.

LG #17

LESSON TOPIC: LEAD SAFETY PROGRAM

AVERAGE TIME: 30 Minutes (add 16 minutes for the videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Chapter B10
- b. 29 CFR 1910.1025

TRAINING AIDS:

- a. Personal protective equipment
- b. Handout #1- 29 CFR 1910.1025
- c. Videotape - "Lead Dust" (Shipyard Industrial Design Center Training Modernization Program), "(NW0446-85-07)"
- d. Quiz

OBJECTIVES:

All designated lead workers should understand the health hazards associated with exposure to lead, the required work procedures when lead exposure is possible, and the medical surveillance requirements for people working with lead.

TARGET AUDIENCE:

All lead workers and supervisors.

REQUIREMENT:

Initial training for all lead workers or personnel with the potential for lead exposure, in accordance with OPNAVINST 5100.19B. All designated lead workers must receive training on and a copy of 29 Code of Federal Regulations (CFR) 1910.1025.

INTRODUCTION

Lead exposure has been recognized for decades as a serious health hazard. If you ingest lead, it can damage your nervous system, blood forming organs, kidneys, and reproductive system. In children, lead poisoning can lead to mental retardation and severe learning disabilities. Although we normally associate lead in the Navy with lead-based paints, we also come into contact with other sources of lead. The NAVOSH Lead Control Program has been developed to prevent lead poisoning and related injuries during the use, handling, removal, and melting of materials containing lead.

A. BACKGROUND

1. Since ancient times, people have used the soft, gray metal - lead - to make pipes, jars and bright pottery glazes.
2. Some experts say, that explorers searching for the Northwest passage suffered lead poisoning from the solder in food cans. The resulting mental disorders caused bad decisions and all in the expedition were lost.
3. Lead has been shown through years of research to be toxic to the human body.
4. Lead enters the body through inhalation or ingestion. It can cause anemia and can affect the kidneys, the nervous system, and the reproductive system. Lead may adversely affect the fetus of a lead exposed worker.
5. Lead is found aboard ship in:
 - a. Lead-based paint.
 - b. Ballast and radiation shielding.
 - c. Pipe joints.
 - d. High voltage cable shielding.
 - e. Small arms ammunition.
 - f. Batteries.
 - g. Weights and cable sockets.

- h. Lead exposure can occur during grinding, sanding spraying, burning, melting, soldering, machining, disassembling engines with leaded gasoline, and handling contaminated protective clothing.
 - i. The greatest health hazard comes from lead dust, since the fine particles can easily be inhaled or ingested. Most ingestion exposures occur when personnel eat or smoke without washing the lead dust off their hands.
- 6. Lead exposure can be eliminated through good work practices and respiratory protection.
- 7. The Navy's lead control program helps prevent lead exposure by defining protective equipment requirements, safe work precautions, and medical surveillance.

B. THE LEAD CONTROL PROGRAM

- 1. The elements of the Navy's lead control program are:
 - a. An industrial hygiene survey to pin point areas or processes of potential lead exposure through workplace monitoring.
 - b. Control of lead in the workplace through work practices and protective equipment.
 - c. Environmental protection and proper waste disposal of debris and contaminated clothing.
 - d. Medical surveillance to detect signs of lead poisoning through blood tests and examinations.
 - e. Worker and supervisor training.
- 2. Wherever possible, the Navy is substituting lower lead content or lead-free paints and coatings substituted for paints containing lead. However, there are many lead-based paints still in use in the Navy. Coatings in place may also contain lead, especially if 5 years old or older.
- 3. OSHA has a very well defined lead control program. We must apply the same parameters to the Navy's program.

HANDOUT COPIES OF 29 CFR 1910.1025 TO EVERY LEAD WORKER. IT IS MANDATORY FOR EACH LEAD WORKER HAVE A COPY.

C. INDUSTRIAL HYGIENE SURVEYS AND WORKPLACE CONTROLS

1. All workplace controls have one goal - To prevent lead from entering your body.
2. Controls include good ventilation or local exhaust ventilation for dust and fumes.
3. Personal protective equipment may be required where ventilation does not reduce the risk of exposure to acceptable levels.
4. The only way to determine these levels and the risk is to have an Industrial Hygiene Officer evaluate the work site and determine exposures.

DISCUSS THE FINDINGS OF THE SURVEY DONE ABOARD YOUR SHIP.

5. The survey will also tell what kind of respiratory protection is required.
 - a. High efficiency particulate air filtering (HEPA) cartridge respirators offer protection against routine levels of lead dust.
 - b. Organic vapor cartridge-type respirators with paint mist pre-filters, protect workers spraying lead-based paints.
 - b. Respirator fit-testing must be conducted every six months on lead workers. Quantitative fit-testing may be required, depending on the survey findings.
6. Lead work areas must be posted with warning signs, and work area housekeeping means frequent, comprehensive cleaning.
7. Personnel must never eat, drink, smoke, chew, or apply make-up in lead work areas. Personnel must wash their hands and face thoroughly after working with lead.

D. ENVIRONMENTAL PROTECTION AND WASTE DISPOSAL

1. All lead-containing wastes are considered hazardous waste. In some states, even the dry residue in a lead-based paint can is hazardous waste.
2. Lead dust and debris is a water and air pollution hazard. It must be collected and bagged for disposal. One ship in drydock, sandblasted leaded

paint from the hull. There was a heavy fine when the debris in the bottom of the drydock floated into the waterway.

3. All contaminated clothing and scraps are hazardous waste.
4. All lead waste must be securely bagged and labeled for disposal.

E. MEDICAL SURVEILLANCE

1. Medical surveillance for lead workers consists of:
 - a. Preplacement medical evaluation.
 - b. Blood lead level monitoring.
 - c. Follow-up evaluations based on the blood test results.
 - d. Removal from exposure to lead, when necessary, based on blood lead levels.
2. Personnel are included in this program if the industrial hygiene survey showed they perform work with lead or are near an operation with lead concentrations at or above the "Action Level" 30 days per year.
 - a. The "Action Level" for lead is 30 micrograms of lead per cubic meter of air for an eight hour exposure.
 - b. If you work melting lead for ballast once a year for an hour in a well ventilated area, and have no other lead exposure at work, you will not be placed in medical surveillance.
 - c. Very few Navy military personnel are classified as lead workers.
3. If people were chipping or grinding suspected, or known lead-based paint unprotected (without a respirator), they should report to the MDR for a medical evaluation.
4. People working around lead, complaining of symptoms which could be related to lead exposure, should report to the MDR for medical evaluation.
 - a. Lead is absorbed into the blood stream and affects the kidneys, bone marrow and the nervous system.

- b. The symptoms of lead poisoning include colic pains, bluish spots on the gums, pallor, weakness, constipation, and a paralysis of the hands and forearms.
- c. In chronic exposures, convulsions are common. Permanent nervous system disorders can occur.

SHOW "LEAD DUST" VIDEOTAPE, IF AVAILABLE. DISCUSS EACH SECTION OF THE 29 CFR 1910.1025 WITH STUDENTS.

SUMMARY:

All lead work operations and processes must be evaluated for potential lead exposure. If the Action Level of 30 micrograms per cubic meter of air over eight hours is found at the worksite, and the workers handle lead at least 30 days per year, they are classified as lead workers and placed in surveillance. Occasional lead workers and handlers also need to be trained and warned about the hazards of lead.

FOR MORE INFORMATION USE OPNAVINST 5100.19B, CHAPTER B10 AND 29 CFR 1910.1025.

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY. QUIZ KEY PROVIDED.

HANDOUT #1

COPY OF 29 CODE OF FEDERAL REGULATIONS, SECTION 1910.1025 - LEAD. YOU CAN GET COPIES FREE FROM THE DEPARTMENT OF LABOR. CONTACT YOUR NEAREST TENDER OR REPAIR SHIP OR SHORE MEDICAL FACILITY. REPRODUCE LOCALLY. EACH LEAD WORKER MUST RECEIVE A COPY OF THIS PUBLICATION.

8. Lead paint chips and dust can be swept up and thrown into the dumpster.

- A. True
- B. False

9. Warning signs must be posted around every lead operation.

- A. True
- B. False

10. Most ingestion of lead results from personnel smoking or eating around the work site.

- A. True
- B. False

LEAD SAFETY QUIZ KEY

1. B
2. B
3. D
4. C
5. A
6. A
7. A
8. B
9. A
10. A

LG #18

LESSON TOPIC: BACK INJURY PREVENTION

AVERAGE TIME: 30 Minutes (add 22 minutes for videotape)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B, Change 1, Chapter A4
- b. U.S. Navy Way to a Healthy Back
(0506-LP-800-0780)
- c. About Back Problems (0506-LP-800-0070)

TRAINING AIDS:

- a. Videotape - "Back Injury Prevention" (803503-DN)
- b. Handout #1 - Lift Right

OBJECTIVES:

The student should understand back injuries can result in painful strains and sprains leading to lost work time or disability. The student should know the proper lifting techniques to avoid back injuries and exercises to strengthen the back and prevent injury.

TARGET AUDIENCE:

All hands, including supervisory personnel, and especially recommended for cargo handlers and working party members.

REQUIREMENT:

Initial training for all personnel in accordance with OPNAVINST 5100.19B. This lecture should be part of indoctrination training when discussing the occupational safety and health program. The lesson can also be presented as a separate lecture, if desired.

INTRODUCTION

Navy studies show that back injuries are the cause of a many lost work days at-sea. From 1980 to 1988, hospitals admitted 11,230 active duty sailors for back injuries. Eventually, 47% received medical or physical evaluation boards for the back injuries. Back problems can result in pain, lost work time, inconvenience (to the individual and the Navy) and possible disability. The back is the most injury-prone part of the body. Almost everyone will suffer back pain at some time in their life. Preventing back injury is much easier than correcting or healing a back injury.

A. BACKGROUND

1. Your back supports your whole body.
 - a. The spine consists of 33 bones, or vertebrae. The upper 24 are separated by discs acting as cushions.
 - b. The spinal cord is a half-inch "cable" of nerves about 18 inches long. It controls all activities below the neck.
 - c. Thirty-one branches of nerves extend from the spinal cord. They send information to the brain and orders the muscles.
 - d. The 400 attached muscles produce motion in all directions, and are attached to the bones by about 1,000 tendons.
 - (1) Being overweight can put extra strain on those muscles.
 - (2) If you are out of shape, your muscles may be weak and unable to do their supporting job.
 - (3) Poor posture, such as slouching, puts pressure on the back and curvature of the back.
2. Common back problems include:
 - a. Strain and fatigue of the muscles.
 - b. Fractured vertebrae, which may injure the spinal cord and possibly cause paralysis.

- c. Ruptured or "slipped" disc, which can press on the spinal nerve and cause pain in the lower back and legs.
- d. Diseases such as arthritis or infection can weaken the back leading to more serious problems.

B. PREVENTING BACK INJURIES

1. There are several way to help prevent back injuries.

- a. Exercise can strengthen the back, stomach and leg muscles. Several easy exercises include:
 - (1) Pelvic tilt - Lie on your back, knees bent, with your feet flat on the floor. Tense your stomach muscles so that the small of your back presses against the floor. Squeeze your buttocks together and lift your hips slightly off the floor. Hold for a count of 10 and relax, then repeat.
 - (2) Knee-to-chest - Lie flat on your back with your legs straight. Grasp one knee and bring it as close to your chest as possible. Hold for a count of 10 and relax, then repeat.
 - (3) Bent-leg-sit-ups - Lie flat on the floor, knees bent with the feet flat on the floor. Arms may be at your sides or folded across your chest. Raise your head, chest and shoulders off the floor. Relax and repeat.
- b. Good posture can make a significant difference in preventing back pain.
 - (1) Sit with the knees higher than the hips; use a low stool to raise the feet slightly; cross the knees for temporary relief, and keep the lower back flat against a firm backrest.
 - (2) Stand tall, head held high, chin tucked in, abdomen flat, hips tucked under, chest slightly up and forward. When leaning forward, bend knees slightly.

HAVE ONE STUDENT DEMONSTRATE PROPER POSTURE STANDING AND SITTING.

C. BACK-SAVING TIPS

1. On the job back saving tips include:

- a. When working on your back, keep the knees bent to flatten your back.
- b. When working low, bend your knees deeply to relieve strain.
- c. Plant your feet firmly for all lifting jobs. Slips and jerks can injure the back.
- d. Dismount from platforms and vehicles carefully. Lower yourself slowly - do not jump.
- e. Don't try to catch falling objects.
- f. When driving, keep the seat forward so that your knees are bent, higher than your hips.
- g. Use moving and lifting tools, such as hand trucks, lifts, hoists and dollies.

(1) In one factory, the investment in \$300 worth of hand trucks saved the company over \$10,000 the first year in back injury lost work time.

2. To protect the back while working at home:

- a. Choose lightweight tools, such as shovels and hoes, with long handles. Stand near the work instead of reaching.
- b. When shoveling, keep the hands widely separated for good leverage. Lift with your knees, back straight. Don't twist or reach out too far to throw the dirt.
- c. Use work saving devices, such as wheel barrows, to move heavy objects.
- d. Stop and stretch often.

D. EMERGENCY FIRST AID FOR BACK INJURIES

1. A severe blow or twist to a person's head, neck, or back may cause a fracture of the spine or neck.

- a. Signs of a fracture include severe pain across the chest, abdomen or down the legs; muscle spasms; and weakness or numbness below the area of injury.
- b. If you even suspect a fracture:
 - (1) Call away a MEDICAL EMERGENCY, through the Quarterdeck OOD, CDO, or DC Central.
 - (2) DO NOT MOVE the victim. Give first aid for breathing failure, bleeding and shock on the scene while awaiting help.
 - (3) When moving the victim is unavoidable (fire or other hazard), with three helpers roll the victim on his or her side; keep the head, neck and back straight; slide a rigid stretcher or board under the victim and roll them back.
 - (4) Do not let the victim sit, stand or walk.
- c. For a severe back strain or sprain, obvious due to the intense pain felt by the victim:
 - (1) Call for medical help.
 - (2) Assist the victim in laying flat or assuming a position of least pain.
 - (3) Avoid unnecessary movement until help arrives.
- d. If you experience a back injury or strain, report it to medical as soon as possible. Usually, the pain is bothersome enough to cause you to seek medical attention. Medication and rest can help you avoid chronic back problems in the future. Back surgery can alleviate or correct many disc and bone problems.

SUMMARY:

Back injuries cost thousands of dollars and hundreds of hours lost work time each year, not to mention pain and suffering. Back injuries can affect anyone, at any age, in any line of work. Yeomen, busy at a desk all day can suffer back pain as readily as a Boatswain's Mates lifting heavy lines. Both may lose work and effectiveness. Exercise, careful lifting techniques and good posture can prevent most back injuries and back pain.

FOR MORE INFORMATION CONSULT, "U.S. NAVY WAY TO A HEALTHY BACK "(NSN 0506-LP-800-0780) OR "ABOUT BACK PROBLEMS" (NSN 0506-LP-800-0070).

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY. QUIZ KEY IS PROVIDED.

LIFT RIGHT

MANY BACK INJURIES ARE THE RESULT OF IMPROPER LIFTING.

THE GENERAL RULES FOR ALL SITUATIONS ARE:

STAND CLOSE TO THE OBJECT. HAVE FIRM FOOTING.

SQUAT DOWN AND STRADDLE THE OBJECT. KEEP THE
BACK STRAIGHT AND BEND THE KNEES.

GRASP THE OBJECT FIRMLY. BE SURE YOUR GRIP WILL
NOT SLIP.

LIFT WITH THE LEGS. SLOWLY STRAIGHTEN THE LEGS
AND BRING THE BACK INTO A VERTICAL POSITION.

HOLD THE OBJECT FIRMLY, CLOSE TO THE BODY.

SET DOWN THE OBJECT CAREFULLY, AGAIN SQUATTING AND
BENDING THE LEGS.

LIFTING OVERHEAD:

LIFT LIGHTER LOADS OVER YOUR HEAD TO AVOID STRAIN.

SPREAD YOUR FEET FOR A BALANCED FOOTING.

USE A PLATFORM OR LADDER FOR EXTRA HIGH LIFTS.

GET HELP TO BALANCE OVERHEAD LOADS.

LIFTING HEAVY OBJECTS:

GET HELP TO LIFT HEAVY OBJECTS.

USE MECHANICAL AIDS SUCH AS FORKLIFTS AND HAND TRUCKS.

PIECE BY PIECE OR MOVE THINGS IN SMALLER PARTS.

DON'T TRY TO PROVE ANYTHING LIFTING TOO HEAVY A LOAD.

BACK INJURY PREVENTION QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. The spine consists of only one long bone down your back.
 - A. True
 - B. False
2. Most back injuries consist of a "slipped disc" in the back.
 - A. True
 - B. False
3. Poor posture contributes to back pain and back muscle strains.
 - A. True
 - B. False
4. Exercises for the back can prevent back pain and relieve back pain.
 - A. True
 - B. False
5. Your chair should be adjusted high, so your legs do not touch the floor, for best posture.
 - A. True
 - B. False
6. To prevent back injury, when lifting an object you should:
 - A. Keep the legs straight
 - B. Bend over at the waist
 - C. Reach out toward the object
 - D. Squat down and straddle the object.
7. Only very heavy objects can cause back injury from lifting.
 - A. True
 - B. False

8. You need to warm-up before exercising but not before doing physical work.

- A. True
- B. False

9. When you find someone who may have a fractured back, you should:

- A. Call away a medical emergency.
- B. Roll the person over to check for bruises.
- C. See if they can sit up on their own.
- D. Poke their feet to see if they are paralyzed.

10. There is no need to report to sick call if you are just having a few spasms in your back.

- A. True
- B. False

BACK INJURY PREVENTION QUIZ KEY

1. B
2. B
3. A
4. A
5. B
6. D
7. B
8. B
9. A
10. B

LG #19

LESSON TOPIC: MISHAP INVESTIGATION AND REPORTING

AVERAGE TIME: 30 MINUTES

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.21A
- b. OPNAVINST 5100.19B, Chapter A6
- c. OPNAVINST 5102.1C

TRAINING AIDS:

- a. HANDOUT #1 - Internal Mishap/Near-Mishap Report form
- b. HANDOUT #2 - Accident/Injury Report form
- c. HANDOUT #3 - Reportable Mishaps
- d. HANDOUT #4 - Advice to Witnesses form
- e. Quiz

OBJECTIVE:

The student should understand the reasons for mishap investigation and reporting, the purpose of the mishap investigation board, and types of reportable mishaps. The student should be familiar with the concept of privileged information.

TARGET AUDIENCE:

All supervisory personnel.

REQUIREMENT:

This lesson is recommended as initial training for all supervisory personnel.

INTRODUCTION:

The Navy spends millions of dollars each year on accidental damage, fatalities, injuries, and occupational illnesses. In FY 1989, the Navy had 6,523 reported mishaps. Mishaps seriously degrade operational readiness and waste tax dollars. Mishap prevention depends on hazard identification, control, elimination, and correction. When preventive efforts fail, mishaps must be thoroughly investigated to determine the causes and prevent recurrence. The lessons learned from a mishap, or even near-mishap, can yield valuable safety information.

A. BACKGROUND

1. The Navy investigates mishap to determine it's cause. Then responsible personnel formulate corrective action to prevent recurrence.
 - a. A mishap is an unplanned incident causing injury, work-related illness, or death to personnel or material loss or damage to property.
 - (1) Mishaps are prevented by correcting or controlling identified hazards.
 - (2) OPNAVINST 5100.19B defines the NAVOSH Hazard Abatement Program. It follows identified hazards until they are corrected.
 - (3) Where hazard control efforts fail, and a mishap occurs, a thorough investigation can help prevent recurrence.
 - (4) All of our investigation and reporting efforts are aimed at preventing mishaps.
 - b. All mishaps should be investigated.
 - (1) Even a minor mishap, such as tripping on a door coaming and spraining an ankle, may yield valuable safety information. For example, changing the burned out light bulb near the door or painting the coaming yellow may prevent someone else from injury. It should not be just assumed the injured person was clumsy or in a hurry.
 - (2) All mishaps which cause injury or damage on board ship are of interest to the command.

- c. Safety mishap investigations do not assess blame or develop information for disciplinary proceedings.
 - d. Mishap investigations must be conducted separately from all other investigations, including JAGMAN investigations. Everything about a safety mishap investigation must be kept separate from a JAGMAN investigation.
 - e. Mishap investigations collect information for safety purposes only.
2. Many different kinds of mishaps may occur on board ships and to off-duty personnel.
- a. Mishaps are reported internally within the ship first. This is done through an Internal Mishap/Near-Mishap report or Accident/Injury Report. If serious, the command sends an OPREP-3 or UNIT SITREP.
 - (1) Everyone is encouraged to report mishaps or near-mishaps to their supervisor or the Safety Officer.
 - (2) Mishaps can be reported using an Internal Mishap/Near-Mishap Report form. Mishaps involving injuries are reported by the Medical Department on Accident/Injury forms.

GIVE OUT HANDOUT #1 - INTERNAL MISHAP/NEAR MISHAP FORM AND HANDOUT #2 - ACCIDENT/INJURY REPORT FORM. GO OVER THE FORMS AND SHOW WHAT IS REPORTED ON EACH ONE.

- (3) The Safety Officer or division officer usually investigates these mishap reports.
 - (4) Results of these reports and investigations help the Safety Officer manage the command mishap prevention program.
- b. Selected mishaps are reported to the Naval Safety Center. They keep safety statistics and analyze safety data.
 - (1) Reportable mishaps usually involve serious injuries or fatalities, or high cost material damage.
 - (2) Mishap severity is based on mishap costs and levels of injury.

GIVE OUT HANDOUT #3 - REPORTABLE MISHAPS. THE STUDENTS CAN FOLLOW ALONG AS YOU DISCUSS THE TYPES OF MISHAPS)

c. The following mishaps must be reported outside of the command:

- (1) Class A Mishap. The total cost of reportable damage is \$1,000,000 or more; or, any injury or work-related illness resulting in death or permanent total disability.
- (2) Class B Mishap. The total cost of reportable property damage is \$200,000 or more, but less than \$1,000,000; an injury or work-related illness resulting in permanent, partial disability; or, a mishap resulting in the hospitalization of five or more people.
- (3) Class C Mishap. The total cost of reportable property damage is \$10,000 or more, but less than \$200,000; or, an injury preventing an individual from performing regularly scheduled duty or work beyond the day or shift on which it occurred; or, a nonfatal illness or disability causing loss of time from work or disability at any time (lost time case). For data collection and analysis purposes, Class C mishaps will be reported to the Naval Safety Center if:
 - (a) The total cost of reportable property damage is \$10,000 or more, but less than \$200,000.
 - (b) There is an injury preventing an individual from performing regularly scheduled duty or work 5 days beyond the day or shift on which it occurred.
- (4) Special Case Mishaps. For data collection and analysis purposes, the following special case mishaps are reportable to the Naval Safety Center:
 - (a) All cases of man overboard, collision, grounding, flooding, explosion, or electrical shock.
 - (b) All fires, except small trash fires in which no one is injured and material

damage is limited to the container in which the fire started.

- (c) All cases of hazardous material, chemical, or toxic exposure requiring medical attention.
 - (d) All cases of oxygen deficiency requiring medical attention.
 - (e) All cases of back injury requiring medical attention.
 - (f) All mishaps involving explosives, oxidizers, incendiaries, explosive systems, or chemical warfare agents. They include the detonation, accidental launch, malfunction, dangerous defect, improper handling, damage to a launching device, weapon impact off-range or other unusual or unexpected weapons-related occurrence.
- 3. Class A mishaps require the formation of a mishap investigation board. The board writes a Mishap Investigation Report (MIR).
 - 4. All other reportable shipboard mishaps are reported using a Mishap Report (MR). They are sent to the Naval Safety Center within 30 days of the mishap.
 - 5. Off-duty, recreational, and motor vehicle mishaps are reported using the formats in OPNAVINST 5102.1C.
 - 6. Aircraft, combat, nuclear weapons, nuclear propulsion and explosives mishap have their own reporting requirements contained in their own directives.
 - 7. Landing Craft, Air Cushion have more stringent mishap investigation and reporting requirements. An LCAC standing mishap investigation board investigates all Class A, B, and C mishaps. A Mishap Report (MR) is required on all three mishap categories within 24 hours, followed by a Mishap Investigation Report (MIR) in 30 days.

B. MISHAP INVESTIGATIONS

- 1. When a mishap occurs, the Safety Officer is notified either through an injury report, deck log entry, or by the department head.

2. Once notified, the Safety Officer is responsible for ensuring an investigation is conducted.
 - a. If the mishap is classified as a Class A mishap, an OPREP-3 usually notifies the chain of command.
 - b. The Immediate Superior in Command (ISIC), or higher authority, appoints a mishap investigation board.
 - c. The mishap investigation board then investigates the Class A mishap.
 - d. For all other mishaps, the Safety Officer conducts the investigation and prepares the Mishap Report, motor vehicle or other required report
3. A complete and comprehensive mishap investigation is an essential tool in identifying the cause of a mishap and thereby preventing recurrence.
 - a. Traditionally, the only source of mishap investigation information was a Judge Advocate General (JAG) investigation, also used to determine accountability. In a JAG Manual Investigation, however, valuable safety information might be lost because of the reluctance of witnesses to disclose information for fear of retribution.
 - b. The sole purpose of the safety mishap investigation is mishap prevention, not to determine accountability.
 - c. When a mishap occurs, any tendency to spare an individual's, or the command's reputation must be set aside in favor of providing completely candid reports and opinions designed to identify the precise cause(s).
 - d. To encourage the free and open disclosure of safety information during an investigation, the concept of "privileged information" is used.
 - (1) Privileged information is testimony, evidence, or data given to a mishap investigation board based on assurances the board will use the information for safety purposes only, and not in any judicial or administrative proceedings.

- (2) If privileged information is used for purposes other than safety, the entire naval community will lose credibility. If that credibility is lost, vital safety information in future mishaps could also be lost.
- (3) All personnel involved as witnesses or as investigators should know that mishap information will be protected. The statements for safety investigations are never taken under oath, and can be rumors, hearsay, or opinions about the mishap, as well as know facts.

GIVE OUT HANDOUT #4 - SAMPLE ADVICE TO WITNESSES FORM.
READ OVER THE FORM AND SHOW HOW THE INFORMATION CANNOT BE
USED FOR ANY ADMINISTRATIVE OR DISCIPLINARY ACTIONS.

C. MISHAP INVESTIGATION BOARDS

1. When a Class A mishap occurs on board ship, the investigation will be conducted by a formal, appointed mishap board.
 - a. The mishap investigation board consists of a Senior Member and at least two other board members.
 - b. If the mishap involved an injury or death, a medical member of the board may be appointed.
 - c. The Immediate Superior in Command (ISIC) usually is the appointing authority and appoints the Senior member in writing.
 - (1) The ISIC can appoint or delegate the appointment of the rest of the mishap board.
 - (2) The board usually consists of commissioned, unrestricted line officers, except for LCAC mishaps, where it can be an experienced senior enlisted member.
 - d. The board may be assisted by any number of technical advisors and a representative from Naval Safety Center, but these advisors are not members of the mishap investigation board.
2. The Senior Member convenes the board, conducts the investigation and makes a report to the chain of command.

- a. The board gathers evidence, takes statements, and consolidates information about the mishap.
- b. A Mishap Investigation Report (MIR) giving the probable or known causes, conclusions, and recommendations is sent through the chain of command.
 - (1) The ISIC and others in the chain of command endorse the MIR and make comments.
 - (2) The report eventually goes to the Naval Safety Center, who does the final endorsement.
 - (3) This MIR provides information which will be put out as lessons learned to the fleet.
- c. The MIR is required to be sent within 30 days of the convening of a mishap board.

D. CONDUCTING A SAFETY INVESTIGATION

- 1. Whether the mishap is a Class A major fatality or a minor material damage mishap, the scene of the mishap and witnesses may yield valuable information.
- 2. After a mishap occurs, the ship must take care to preserve the mishap scene and save evidence.
 - a. If possible, protect the mishap site or damaged area from loss or further damage. Operational requirements or damage control measures may require disturbing the scene of the mishap before the mishap investigation board arrives. In such cases, make every reasonable effort to:
 - (1) Make an accurate plot of the scene.
 - (2) Take photographs or videotape recordings of the wreckage, its distribution, and the surrounding area.
 - (3) Diagram any underwater damage.
 - b. Depending on the circumstances of the commanding officer may direct the collection of any transitory medical evidence, such as specimens to determine blood alcohol and drug levels, appropriate for the mishap investigation.

3. The mishap investigators, either a mishap board or the Safety Officer:
 - a. Collect, organize, interpret and protect all physical and testimonial evidence.
 - b. Ensure photographs and videotapes accurately depict the mishap scene.
 - c. Interpret logs, records, blueprints, schematics, and written procedures.
 - d. Take statements from witnesses, including advising all witnesses in writing of the restricted uses of their privileged testimony.
 - e. Reconstruct the sequence of events leading up to, and immediately following, the mishap.
4. The mishap investigator gathers evidence of the mishap.
 - a. A witness statement is an account of the circumstances surrounding a mishap recalled by the witness. The statement is not obtained under oath and may include opinions, secondhand information, and speculation about the mishap.
 - b. Medical materials the board may use as evidence includes laboratory results, medical records, hospital admission forms, diagrams of wounds, psychological profiles, or physician's written opinions.
 - (1) Because of the transitory nature of some medical evidence, quick action by the medical department representative (MDR) at the scene is necessary.
 - (2) The MDR shall collect the initial, particularly transient, medical evidence as directed by the commanding officer or higher authority.
 - (3) The transient evidence includes specimens to determine blood alcohol and drug levels.

c. Wreckage or damaged equipment is physical proof of a mishap. The physical proof includes the area or equipment directly affected by the mishap and the surrounding damaged areas.

(1) The command officer must make every reasonable effort to preserve and protect damaged equipment and wreckage in its original position and condition following the mishap. If necessary, cordon off, secure or guard mishap scenes to prevent disturbance of wreckage.

d. If, during the investigation, an investigator discovers signs of a criminal act related to the mishap, it must be reported immediately to the commanding officer or board appointing authority. The CO or appointing authority shall notify the Naval Investigative Service.

e. Evidence gathered by the mishap investigation board may be releasable to other investigators. The investigator shall not release information revealing the source of any physical evidence obtained as a result of privileged information, nor any testimony given under the assurance of privilege.

E. DETERMINING MISHAP CAUSES

1. The investigator must consider all the possible causes of a mishap. The investigator must determine the cause(s), supported by the available evidence. Some possible causes may be rejected because of a lack of supporting evidence.

2. Mishap causes vary but any may have contributed to the mishap.

a. Human Error

(1) More than 50% of all mishap investigations determine the cause was human error.

(2) Human error findings take into account human involvement in the events leading up to a mishap, action taken by personnel as the mishap is occurring, and actions taken after the mishap occurred.

- (3) Human error takes into account both physical and mental factors.
- (4) Physical human error factors to consider in a mishap investigation include ergonomics (design of the workplace), physical strength and condition of the individual, physical stresses, and the body's subsequent responses.
- (5) Mental human factors include the person's attitude, ability to retain and assimilate training, external mental stresses such as interpersonal relationships, and mental illnesses.
- (6) The Medical Officer, when assigned, investigates and analyzes human factors such as physical and mental conditions.

b. Maintenance and Support Factors

- (1) Maintenance and support factors may include improper maintenance, poor assignment of priorities on work requests, or lack of proper Quality Assurance (QA).
- (2) Shipyards, Intermediate Maintenance Activities, contractors, or ship's force may be connected with maintenance- and support-related mishaps.

c. Administrative and Supervisory Factors

- (1) The investigation must consider the possible effect of regulations, and their enforcement from all levels in the chain of command.
- (2) Execution of procedures and policies published by higher authority, such as Naval Warfare Publications (NWPs), Navy Tactical Publications (NTPs), Operational Orders (OPORDs), and Standing Orders are possible contributing factors.
- (3) On board ship, supervisory factors concerning operating or maintenance personnel should be considered. This includes supervisor training, qualification, proficiency, and physical condition.

d. Material Failures or Malfunctions

- (1) The investigator must consider all material failures and malfunctions thoroughly, regardless of whether they were because of faulty design, defective manufacture, or repair.

e. Environmental Conditions

- (1) Environmental conditions are usually not cause factors. For example, a cause of a mishap might be excessive speed for existing sea conditions or failure to secure for sea, but the high sea state did not cause the mishap.

F. MISHAP AND INVESTIGATION REPORTS

1. If a mishap falls into the "reportable" category, the Safety Officer or the Senior Member of a mishap investigation board prepares a report.

- a. If a mishap board did the investigation, the Senior Member prepares a Mishap Investigation Report (MIR). The format for this report is in OPNAVINST 5100.21A.

- (1) The MIR contains all the factual information about the mishap, such as injured person's names and the extent of their injuries, and also includes the board's conclusions on the mishap causes.
- (2) Because the MIR contains causes of the mishap, it is considered a Limited Use Mishap Report. This means the MIR contains privileged information and cannot be released to just anyone. It is to be used for safety purposes only.
- (3) The MIR is endorsed by the chain of command and goes to the Naval Safety Center.

- b. If the mishap is not investigated by a board, and the information was gathered by the Safety Officer or other investigator, a Mishap Report (MR) is submitted.

- (1) The MR contains only factual information and no conclusions about the mishap causes.

- (2) The MR is a General Use Mishap Report and does not contain privileged information.
- (3) This report is sent directly to the Naval Safety Center.
- c. Both reports must be submitted within 30 days of the mishap or convening of a mishap board.
- d. Both reports may be used to develop lessons learned and prevent future mishaps.

SUMMARY:

Mishap prevention is accomplished through good hazard identification, correction, or control. When they fail and a mishap occurs, we must take all necessary action to prevent the recurrence of the mishap. To determine the cause of a mishap, and prevent recurrence, we must do a thorough mishap investigation. It is important for the crew to understand why we do mishap investigations, and that investigation information is privileged and use for safety purposes only.

FOR ADDITIONAL INFORMATION, CONSULT OPNAVINST 5100.21A AND OPNAVINST 5102.1C.

ADMINISTER 10 QUESTION QUIZ. REPRODUCE LOCALLY. QUIZ KEY IS PROVIDED.)

HANDOUT #1

INTERNAL MISHAP/NEAR MISHAP INVESTIGATION REPORT

From: _____ Division Officer

To: Commanding Officer

Via: (1) _____ Department Head
(2) Safety Officer
(3) Executive Officer

Date/Time of Mishap: _____ Mishap Category: _____

Location of Mishap: _____

Brief Description of Mishap (Including extent of injury and property damage): _____

Work/Task Supervisor (at the time of mishap): _____

Witnesses: _____

Photos taken (circle one)? YES NO N/A

Cause of Mishap: _____

Corrective Action Taken or Recommended: _____

Signature/Date

2nd Endorsement _____

Does Mishap Meet External Reporting Requirements (circle one)?
YES NO

If yes, indicate the DTG or letter serial number of report:

(Attach copy or report)

Safety Officer

RETURN COMPLETED INVESTIGATION REPORT TO SAFETY OFFICER

**INSTRUCTIONS FOR FILING OUT INTERNAL MISHAP/NEAR MISHAP
INVESTIGATION REPORT**

1. Complete this report within 10 working days of the mishap/near mishap. If the report is not completed in 10 working days, annotate on the report the reason for delay.
2. Mishap Category examples are as follows: Collision, Flooding, Grounding, Electric Shock, Deck Seamanship, Man Overboard, Chemical/Toxic Exposure, Heat Injury, Aircraft/Aviation, Material Failure, Machinery Operation, Heavy Weather, Small Boats, Injury, Cargo Handling, Explosion, Ordnance.
3. Location description should be as thorough as possible. Give compartment number and location within compartment, if applicable. Give frame number, deck (or level), and side if topside. Give location on pier, or drydock or building if off ship. A drawing of location may be useful and should be attached, if appropriate.
4. Work/Task Supervisor is the name of the person who assigned the task or was overseeing the evolution when the mishap occurred. If not applicable, so state.
5. External Reporting Requirements are contained in Chapter A6 of OPNAVINST 5100.19B.
6. Reviewing officers shall either note the report or provide comments/direction on the back or on a separate sheet. The completed report will be returned to the safety officer for filing.

ACCIDENT/INJURY REPORT

From: Medical Officer

To: Commanding Officer

Via: (1) _____ Division Officer
(2) _____ Department Head
(3) Executive Officer

Subj: INJURY REPORT

	NAME	RANK	SSN	DIV
1. Identification of Injured:	_____			
2. Date/Time/Location of Injury:	_____			

	DATE	TIME	LOCATION
3. First Seen by MDR:	_____		
4. Condition of Individual When First Seen:	_____		
5. Alleged Injury Circumstances and Source of Information:	_____		
6. Diagnosis:	_____		
7. Prognosis:	_____		
8. Treatment:	_____		

9. The following finding is recommended: _____, In line of duty, not due to own misconduct; _____, Not in line of duty, due to own misconduct; _____, Not in line of duty, not due to own misconduct.

_____ MDR Signature/Date

Copy to: Safety Officer
OOD - Action: Make "Late entry" in ship's log
File

RETURN COMPLETED INJURY REPORT PLUS ENDORSEMENTS TO SAFETY OFFICER

INSTRUCTIONS FOR FILLING OUT INJURY REPORT

1. The Division Officer of the injured individual shall evaluate the cause of the injury and recommended corrective action (if any) to prevent recurrence. The reverse side of the report or a separate sheet shall be used for this recommendation.
2. Condition of Patient When First Seen. The following are sample descriptions: unconscious, semi-conscious, alert, odor of alcohol, dilated pupils, truculent, cooperative, incoherent, uncoordinated, unsteady. If a clinical test was run on the individual, note if positive for drugs or percent of alcohol.
3. Alleged Injury Circumstances can be obtained from either the injured person or eyewitness(es). This should be as thorough as possible to identify potential hazards and the need for a mishap investigation.
4. The Prognosis should indicate the possibility of the injury causing a permanent total disability, a permanent partial disability or no disability. It should also estimate the loss of time from duty (if any) as a result of the injury or the date of return to duty.
5. Reviewing officers shall either note the report or provide comments, recommendations, or direction on the back of the report or on a separate sheet. The completed report will be returned to the safety officer for filing.

REPORTABLE MISHAPS

The following mishaps must be reported to the Naval Safety Center. This reporting is required by OPNAVINST 5100.21A.

Class A, B, and C mishaps are classified according to cost of material damage and extent of fatality, injury or disability. DODINST 6055.7 defines the severity classifications. The Naval Safety Center has added reporting requirements for data collection purposes.

Class A Mishap. The total cost of reportable damage is \$1,000,000 or more; or any injury or work-related illness resulting in death or permanent total disability.

Class B Mishap. The total cost of reportable property damage is \$200,000 or more, but less than \$1,000,000; an injury or work-related illness resulting in permanent, partial disability; or a mishap resulting in the hospitalization of five or more people.

Class C Mishap. The total cost of reportable property damage is \$10,000 or more, but less than \$200,000; or an injury preventing an individual from performing regularly scheduled duty or work beyond the day or shift on which it occurred; or a nonfatal illness or disability causing loss of time from work or disability at any time (lost time case). For data collection and analysis purposes, Class C mishaps will be reported to the Naval Safety Center if:

1. The total cost of reportable property damage is \$10,000 or more, but less than \$200,000.
2. There is an injury preventing an individual from performing regularly scheduled duty or work 5 days beyond the day or shift on which it occurred.

There are certain military and shipboard unique mishaps for which the Naval Safety Center collects data. These are called "special case" mishaps and must be reported to the Naval Safety Center within 30 days of occurrence. Some of these mishaps may also fall into the reportable categories above.

Special Case Mishaps. For data collection and analysis purposes, the following special case mishaps are reportable to the Naval Safety Center:

1. All cases of man overboard, collision, grounding, flooding, explosion, or electric shock.
2. All fires, except small trash fires in which no one is injured and material damage is limited to the container in which the fire started.
3. All cases of hazardous material, chemical, or toxic exposure requiring medical attention.
4. All cases of oxygen deficiency requiring medical attention.
5. All cases of back injury requiring medical attention.
6. All mishaps involving explosives, oxidizers, incendiaries, explosive systems, or chemical warfare agents. They include the detonation, accidental launch, malfunction, dangerous defect, improper handling, damage to a launching device, weapon impact off-range or other unusual or unexpected weapons-related occurrence.

ADVICE TO WITNESSES

THIS IS PART OF A LIMITED USE MISHAP INVESTIGATION REPORT.
LIMITED DISTRIBUTION AND SPECIAL HANDLING ARE REQUIRED AS
PROVIDED FOR IN OPNAVINST 5100.21A.

PLEASE READ THIS STATEMENT CAREFULLY.
CERTIFY THAT YOU UNDERSTAND IT BY YOUR SIGNATURE AT THE BOTTOM

I understand:

a. I have been requested to provide information to a mishap investigation board.

b. No one requested me to provide this statement under oath or affirmation.

c. Disclosure of personal information by me is voluntary; failure to provide such information will have no effect on me.

d. The mishap investigation board will use the information I provide ONLY to determine the cause(s) of a mishap. They will use it ONLY for safety purposes.

e. No one will use the information I provide in any punitive or administrative proceedings, in any other investigation, to determine misconduct of anyone, or to determine government liability.

f. The information provided by me shall NOT be used:

(1) In any determination affecting my interests.

(2) As evidence or to obtain evidence in determining misconduct or line of duty status of other personnel.

(3) As evidence to determine my responsibility or that of other personnel from the standpoint of discipline.

(4) As evidence to assert affirmative claims on behalf of the government.

(5) As evidence to determine the liability of the government for property damage caused by a mishap.

(6) As evidence before administrative bodies, such as Evaluation Boards (USN) or Field Performance Boards (USMC).

(7) In any other punitive or administrative action taken by the Department of the Navy.

(8) In any other investigation or report of the mishap about which I have been asked to provide information.

1. STATEMENT (Continue on reverse/attach separate sheets)

2. PRINTED NAME		3. SIGNATURE	
4. DATE	5. RANK/RATE	6. SERVICE	7. TELEPHONE NO.
8. YOUR ADDRESS			
9. PRINTED NAME OF BOARD MEMBER		10. SIGNATURE	

MISHAP INVESTIGATION AND REPORTING QUIZ

RATE/NAME: _____ DIV: _____ DATE: _____

CIRCLE THE CORRECT ANSWER.

1. All the witness statements taken during a safety mishap investigation can be used in the JAG investigation.
 - a. True
 - b. False
2. A Class A mishap is one that results in:
 - a. Little damage or injury
 - b. No personnel injuries
 - c. Under \$10,000 damage
 - d. At least one fatality
 - e. None of the above
3. An exposure to a hazardous chemical is not reportable if the victim does not require medical attention.
 - a. True
 - b. False
4. A formal mishap investigation board consists of a Senior Member and at least:
 - a. Ten other officers.
 - b. Two other members.
 - c. A medical member, engineer, safety officer and DCA.
 - d. Five members from a different ship.
 - e. Three members, one of which is from the Naval Safety Center.
5. All cases of electrical shock must be reported.
 - a. True
 - b. False
6. A mishap site may be disturbed in an operational or damage control emergency.
 - a. True
 - b. False

7. A mishap may be caused by:

- a. Human factors
- b. Supervisory factors
- c. Environmental factors
- d. Administrative factors
- e. All of the above

8. Witnesses are advised in writing that their statements will be used for safety purposes only.

- a. True
- b. False

9. Near-mishaps, where the mishap almost occurred but did no damage or injury, do not have to be investigated.

- a. True
- b. False

10. A good investigator will try to reconstruct the mishap events.

- a. True
- b. False

ISHAP INVESTIGATION AND REPORTING QUIZ KEY

1. B
2. D
3. A
4. B
5. A
6. A
7. E
8. A
9. B
0. A

LG #20

LESSON TOPIC: INDOCTRINATION DIVISION (I-DIVISION) SAFETY TRAINING

AVERAGE TIME: 3 Hours (including videotapes)

INSTRUCTIONAL MATERIALS:

REFERENCES:

- a. OPNAVINST 5100.19B
- b. OPNAVINST 3120.32B
- c. NSTM, Chapter 300
- d. Ship's safety instructions

TRAINING AIDS:

- a. Lesson Guides #1, #8, #13 (if applicable), and #18 (including videotapes and handouts)
- b. Handout #1 - General Safety Standards (Surface Ship or Submarine, reproduce locally)
- c. Videotapes: NAVOSH - It's Protecting You (804764-DN); Back Injury Prevention (803503-DN); Electrical Safety (805008-DN); Shipboard Tag-out Procedures (805081-DN); and Radiofrequency Radiation Health Hazards (803672-DN)

OBJECTIVE:

The student should be familiar with the command safety and occupational safety and health programs, the identity of key members of the command safety organization, and general shipboard safety references. The student should understand general shipboard safety precautions as they apply to their command.

TARGET AUDIENCE:

All hands upon reporting on board (I-Division or School-of-the-Ship).

REQUIREMENT:

Initial training for all hands, in accordance with OPNAVINST 5100.19B.

INTRODUCTION:

The Navy is obligated, as your employer, to provide you with a safe and healthy work environment. Ships are inherently dangerous with well known safety hazards. To preserve readiness, avoid injuries, and prevent costly material damage, the Navy has a well established afloat safety program. The Navy chain of command supports the safety program. Although the safety of the ship is the ultimate responsibility of the commanding officer, every crew member must cooperate to make the safety program work. At I-Division, we will familiarize you with both general and our ship's safety rules, and explain the need for the various safety and occupational health programs.

- A. BACKGROUND (Adapted from Lesson Guide #1 - Occupational Safety and Health Program. Handout #1 has been added and the text adjusted to reflect I-Division needs.)
1. The 1970 Occupational Safety and Health Act was established to protect American workers. Section 19 of the OSHA law, and several subsequent Presidential Executive Orders directed federal agencies to maintain similar occupational safety and health programs.
 2. Program scope
 - a. A total safety and occupational health program includes all safety programs, such as aviation safety, weapons safety, off-duty safety as well as occupational health programs such as asbestos, hearing conservation, and heat stress programs.
 - b. Safety programs must be implemented by all shore, afloat and aviation commands worldwide. The programs apply to all military and civilian personnel. Every branch of the Armed Forces has implemented a similar program.
 3. Directives
 - a. OPNAVINST 5100.23B - The NAVOSH Program Manual established the Navy's overall safety and health program. Since ships have unique and specific situations not addressed in that Manual, the Navy developed a separate manual for forces afloat.
 - b. OPNAVINST 5100.19B - NAVOSH Program Manual for Forces Afloat was implemented in April 1989. This directive is the primary resource document for ships and submarines.

INTRODUCE AND SHOW THE VIDEOTAPE, "NAVOSH - ITS PROTECTING YOU," IF AVAILABLE)

B. NAVOSH PROGRAM ELEMENTS

1. Occupational health

- a. Occupational health deals with the health of workers on the job, or effects as a result of their job.
- b. Unlike safety, where the results of a mishap are quickly evident (fall down a ladder), many occupational illnesses and diseases do not show up until years after the worker is exposed to the hazard. One good example is hearing loss, which is a gradual condition from years of noise exposure.
- c. The Navy is concerned with these occupational health issues, as well as safety, because of lost work time and the cost of worker compensation.
- d. The occupational health programs of concern include:

LIST THOSE WHICH PERTAIN TO YOUR COMMAND.

- (1) Heat stress
 - (2) Hearing conservation
 - (3) Hazardous materials/hazardous waste
 - (4) Sight conservation
 - (5) Asbestos exposure control
 - (6) Lead safety
 - (7) Radiation and laser safety
 - (8) Respiratory protection
 - (9) Personal protective equipment
- e. These programs are covered by Volume I of the NAVOSH Manual.

2. Safety programs

- a. NAVOSH includes all occupational safety programs.
- b. Most safety mishaps result in immediate injuries or material damage. This affects mission readiness. Anytime a sailor loses a day from work due to a mishap, the command loses a valuable resource and part of the team.
- c. The safety programs under NAVOSH include:
 - (1) Electrical safety
 - (2) Tag-out program
 - (3) Gas-free engineering
 - (4) Deck safety (cargo handling, small boats, UNREP, ground tackle, etc.)
 - (5) Weapons safety (general safety precautions)
 - (6) Shipboard aircraft safety (general safety precautions)
 - (7) Machinery and workshop safety
 - (8) Diving operations (general safety precautions)
 - (9) MSD and CHT safety
 - (10) Hazardous materials handling, storage and disposal

DISCUSS WHICH OF THESE PERTAIN TO YOUR COMMAND.

- d. Volume II of OPNAVINST 5100.19B provides surface ship safety standards. Volume III provides submarine safety standards.
 - (1) Although most basic safety should be common sense, aboard ship there are many uncommon hazards.
 - (2) Handout #1 lists basic safety standards which apply to shipboard duty.

PROVIDE HANDOUT #1 - BASIC SAFETY STANDARDS FOR EITHER SURFACE SHIPS OR SUBMARINES. DISCUSS EACH ITEM.

- e. Separate directives may give detailed safety requirements for weapons handling, aviation operations, and diving safety.
3. The Navy also has off-duty safety programs
- a. Most of the lost work injuries and permanent losses to the command due to injuries are the result of motor vehicle/motorcycle or recreational mishaps.
 - b. The off-duty safety programs include:
 - (1) Traffic Safety, covered by OPNAVINST 5100.12 series.
 - (2) Recreation, Athletic and Home Safety, covered by OPNAVINST 5100.25 series.
 - c. Often, these safety and health programs overlap. Only by taking all occupational health, on-duty and off-duty safety aspects into account, can we cover the entire spectrum of employment in today's Navy.

C. PROGRAM RESPONSIBILITIES

- 1. An Assistant Secretary of the Navy is the designated occupational safety and health official for the Department of the Navy, and issues policies for both military and civilian personnel.
- 2. The CNO is responsible for implementing and managing the NAVOSH program. The NAVOSH Manual is an OPNAV directive.
- 3. Each fleet Commander in Chief, Type Commander, Group and Squadron Command, right down to our own CO, has a responsibility for implementing NAVOSH.
- 4. Each level of command monitors the effectiveness of the NAVOSH program of their subordinates. INSURV, OPPE, Command Inspections, and many other inspection teams look at the NAVOSH programs.
- 5. On board this ship, the Safety Officer, working for the CO and XO, is overall program manager for NAVOSH. The Safety Officer, _____, is assisted by the Electrical Safety Officer, Electronic Safety Officer, all Department Heads and Division Officers, and the Medical Department. All work together for an effective NAVOSH program.

- a. A Safety Council and Safety Committee meet at least quarterly to discuss the command NAVOSH program, problems, and mishaps.
- b. Routine safety and health surveys are conducted throughout the ship, and NAVOSH is added to zone inspections. At regularly scheduled zone inspections, certain spaces would be designated to receive a "safety" zone inspection. The command must survey every work space at least annually.
- c. Workplaces are monitored to ensure safety and health in workshops and offices.
- d. Training is conducted on all the NAVOSH programs to inform sailors, and ensure their cooperation and support of the program.
- e. All hands are encouraged to report safety and health hazards immediately so they can be corrected. This can be done through internal hazard reports, and SAFETYGRAMS, or verbally to the Safety Officer.

ADD ANY SHIP-SPECIFIC POLICIES OR PROCEDURES.

COMPLETE THIS FIRST SECTION BY PRESENTING LESSON GUIDE #18-BACK INJURY PREVENTION.

INTRODUCTION- BACK INJURY PREVENTION

Navy studies show that back injuries are the cause of a many lost work days at-sea. From 1980 to 1988, hospitals admitted 11,230 active duty sailors for back injuries. Eventually, 47% received medical or physical evaluation boards for the back injuries. Back problems can result in pain, lost work time, inconvenience (to the individual and the Navy) and possible disability. The back is the most injury-prone part of the body. Almost everyone will suffer back pain at some time in their life. Preventing back injury is much easier than correcting or healing a back injury.

A. BACKGROUND

1. Your back supports your whole body.
 - a. The spine consists of 33 bones, or vertebrae. The upper 24 are separated by discs acting as cushions.
 - b. The spinal cord is a half-inch "cable" of nerves about 18 inches long. It controls all activities below the neck.
 - c. Thirty-one branches of nerves extend from the spinal cord. They send information to the brain and orders the muscles.
 - d. The 400 attached muscles produce motion in all directions, and are attached to the bones by about 1,000 tendons.
 - (1) Being overweight can put extra strain on those muscles.
 - (2) If you are out of shape, your muscles may be weak and unable to do their supporting job.
 - (3) Poor posture, such as slouching, puts pressure on the back and curvature of the back.
2. Common back problems include:
 - a. Strain and fatigue of the muscles.
 - b. Fractured vertebrae, which may injure the spinal cord and possibly cause paralysis.

- c. Ruptured or "slipped" disc, which can press on the spinal nerve and cause pain in the lower back and legs.
- d. Diseases such as arthritis or infection can weaken the back leading to more serious problems.

B. PREVENTING BACK INJURIES

1. There are several way to help prevent back injuries.
 - a. Exercise can strengthen the back, stomach and leg muscles.
 - b. Good posture can make a significant difference in preventing back pain.
 - c. Sleep on a firm mattress, or use a bed board between the box spring and mattress.
 - d. Adjust your desk chair properly to support the back and relieve strain.
 - e. Stretch frequently and readjust your posture to relieve fatigue.
2. Lifting safely can prevent many serious back injuries.
 - a. Lifting heavy objects is an obvious hazard to the back; but, lifting less than one pound has caused slipped discs and back injuries. It isn't what you lift, necessarily, but HOW you lift it!

DISTRIBUTE HANDOUT #1 - LIFTING SAFELY.

- b. General rules for lifting include:
 - (1) Stand close to the object.
Have a firm footing.
 - (2) Squat down and straddle the load, somewhat. Keep the back straight and BEND THE KNEES.
 - (3) Grasp the object firmly and be sure it won't slip.

- (4) Lift with your leg muscles. Slowly straighten your legs as you lift. After the legs are straightened, bring the back into a vertical position.
- (5) Hold the object firmly close to the body while moving.
- (6) Use the same motions to set the object down.
- (7) Avoid sudden, jerky motions. Turn with the feet instead of the back.
- (8) Do not extend the arms too far away from the body to deposit the object.

HAVE A STUDENT DEMONSTRATE PROPER LIFTING.

c. Before you start to move an object, use your head:

- (1) Examine the object to decide where and how to hold it. Check for grease, oil, moisture and sharp edges.
- (2) Clear your path of obstructions and trip hazards.
- (3) Know where and how you'll let the object down.
- (4) Get help if you have any doubts about lifting an object.

d. Lifting some objects requires special precautions:

- (1) Lifting over your head places extra strain on the back because you cannot use your legs. The load you lift overhead should be lighter. Spread your feet for firm footing, get a ladder or platform, or GET HELP.
- (2) Lifting heavy objects may require two or more people or mechanical assistance. Break down the object into smaller loads, if possible, or one step at a time.

- (3) Working parties loading store aboard ship present special hazards. Personnel tend to throw boxes, work to excess fatigue, try to work too quickly, and have poor supervision. In some instances, there have been multiple back injuries reported as a result of one working party.

SHOW VIDEOTAPE "BACK INJURY PREVENTION" AT THIS TIME, IF DESIRED.

C. BACK-SAVING TIPS

1. On the job back saving tips include:

- a. When working on your back, keep the knees bent to flatten your back.
- b. When working low, bend your knees deeply to relieve strain.
- c. Plant your feet firmly for all lifting jobs. Slips and jerks can injure the back.
- d. Dismount from platforms and vehicles carefully. Lower yourself slowly - do not jump.
- e. Don't try to catch falling objects.
- f. When driving, keep the seat forward so that your knees are bent, higher than your hips.
- g. Use moving and lifting tools, such as hand trucks, lifts, hoists and dollies.

- (1) In one factory, the investment in \$300 worth of hand trucks saved the company over \$10,000 the first year in back injury lost work time.

2. To protect the back while working at home:

- a. Choose lightweight tools, such as shovels and hoes, with long handles. Stand near the work instead of reaching.
- b. When shoveling, keep the hands widely separated for good leverage. Lift with your knees, back straight. Don't twist or reach out too far to throw the dirt.

- c. Use work saving devices, such as wheel barrows, to move heavy objects.
- d. Stop and stretch often.

D. EMERGENCY FIRST AID FOR BACK INJURIES

- 1. A severe blow or twist to a person's head, neck, or back may cause a fracture of the spine or neck.
 - a. Signs of a fracture include severe pain across the chest, abdomen or down the legs; muscle spasms; and weakness or numbness below the area of injury.
 - b. If you even suspect a fracture:
 - (1) Call away a MEDICAL EMERGENCY, through the Quarterdeck OOD, CDO, or DC Central.
 - (2) DO NOT MOVE the victim. Give first aid for breathing failure, bleeding and shock on the scene while awaiting help.
 - (3) When moving the victim is unavoidable (fire or other hazard), with three helpers roll the victim on his or her side; keep the head, neck and back straight; slide a rigid stretcher or board under the victim and roll them back.
 - (4) Do not let the victim sit, stand or walk.
 - c. For a severe back strain or sprain, obvious due to the intense pain felt by the victim:
 - (1) Call for medical help.
 - (2) Assist the victim in laying flat or assuming a position of least pain.
 - (3) Avoid unnecessary movement until help arrives.
 - d. If you experience a back injury or strain, report it to medical as soon as possible. Usually, the pain is bothersome enough to cause you to seek medical attention. Medication and rest can help you avoid chronic back problems in the future. Back surgery can alleviate or correct many disc and bone problems.

AFTER A BREAK, PRESENT LESSON GUIDE #8 - ELECTRICAL SAFETY AND TAG-OUT. USE LESSON GUIDE #8 AS WRITTEN, BUT YOU MAY DELETE THE QUIZ TO SAVE TIME.

AFTER A BREAK, PRESENT LESSON GUIDE #13- RADIATION SAFETY/RADIOFREQUENCY RADIATION HAZARDS. USE LESSON GUIDE #13 AS WRITTEN, BUT YOU MAY DELETE THE QUIZ TO SAVE TIME.

AS PART OF I-DIVISION, IT IS RECOMMENDED THAT TRAINING ALSO BE PRESENTED ON HEAT STRESS, HEARING CONSERVATION, HAZARDOUS MATERIALS CONTROL, SIGHT CONSERVATION AND RESPIRATORY PROTECTION. LESSON GUIDES ARE PROVIDED IN THIS NAVOSH TRAINING GUIDE FOR FORCES AFLOAT FOR THIS TRAINING. IF THERE IS INSUFFICIENT TIME TO PROVIDE A COMPLETE LESSON ON EACH TOPIC, IT IS SUGGESTED YOU SHOW THE FOLLOWING VIDEOTAPES, WITH A SHORT INTRODUCTION, FOLLOWED BY QUESTIONS AND A DISCUSSION:

HEAT STRESS MONSTER	(35025-DN)
HEARING CONSERVATION - SHIPBOARD	(43138-DN)
SHIPBOARD RESPIRATORY PROTECTION	(805009-DN)
STRAIGHT TALK ON EYE SAFETY	(22070-DN)
HAZARDOUS MATERIALS CONTROL AFLOAT	(804939-DN)

HANDOUT #1 - BASIC SAFETY STANDARDS (SURFACE SHIP)

Shipboard life is one of the most hazardous working and living environments that exists. The existence of hazardous materials and equipment, in addition to the fact that a ship is a constantly moving platform subject to conditions such as weather, collision, and grounding contribute to an accident prone environment. Any chain of events could lead to a major catastrophe. It is for this reason, PRACTICAL SAFETY must be followed and the prescribed safety regulations strictly followed to prevent personal injury and illness.

The general safety standards in the following section are applicable to all shipboard operations and spaces.

GENERAL SAFETY STANDARDS

Complying with the following standards may save your life:

1. Locate and remember all exits from working and living spaces you frequent.
2. Know where life jackets are stored in, or near your working and living spaces.
3. Make sure that all movable objects in your spaces are secured or lashed down.
4. Always wear clothing that snugly fits your body.
5. Whenever practicable carry a load in a manner which allows one hand to be free.
6. Always move up or down a ladder with one hand on the railing.
7. Know the emergency shut down procedures for all equipment you use.
8. Always ensure exits are not blocked with equipment or boxes.
9. Always ensure ventilation ducts are free of blockage.
10. Horseplay is dangerous anywhere aboard ship.
11. Rings, watches, key rings, and other items that may become entangled or caught on projections should not be worn.

12. Always wear approved safety shoes when required by the job.
13. Carry as little in your pockets as possible.
14. Walk, don't run in passageways.
15. Always be cautious when nearing a "blind" corner.
16. Know the location of all lifeboat and life raft stations and know how to proceed to them from the living and working spaces you frequent.
17. Know the location of all fire stations and other firefighting equipment in or near the living and working spaces you frequent.
18. Keep constantly familiar with the whereabouts of crew members in the space where you are working, especially if they are working in tanks, voids or other restricted movement areas.
19. Smoke only in designated areas.
20. Equipment shall be used only by authorized personnel and in an authorized manner.
21. Sunglasses shall only be worn topside.
22. If you pass through a watertight door designated to be closed during normal operations, be certain that it is properly closed and dogged.
23. Know where all life rings, markers, and flares are located for man overboard emergencies.
24. Know all areas where protective equipment should be worn.
25. Promptly inform senior personnel responsible for a given space or equipment of all unsafe conditions discovered.
26. Do not lean against lifelines.
27. Keep decks free of obstacles and materials causing slippery conditions, particularly in work areas. Areas that are slippery shall be posted with a warning sign. Ensure non-skid is installed around machinery work areas.

28. Provide temporary protection by guardrails or chains, suitably supported by stanchions or pads, when opening accesses in bulkheads or decks which are normally closed.
29. Never straddle or step over lines, wire, and chains under tension.
30. After opening and prior to passing through a water-tight hatch, scuttle, or manhole cover ensure hatch brace pins and/or safety pawls and scuttle/manhole covers are positively locked.
31. Wear a life-jacket topside where the potential exists of falling, slipping, being thrown or carried into the water.
32. Never lock escape scuttles so they cannot be opened from the inside.
33. Never dismantle or remove any lifeline, or hang or secure any weight or line to any lifeline except as authorized by the commanding officer.
34. Never dismantle any permanent lifeline system without permission of the commanding officer and without providing temporary lifelines.
35. Never dismantle or remove any inclined or vertical ladder without permission of the commanding officer. Such areas shall be secured with temporary lifelines and shall be posted with a warning sign.
36. Never operate machinery or equipment with defective safety devices without specific permission of the commanding officer.
37. Never tamper with or render ineffective any safety device, interlock, ground strap or similar device intended to protect operators or the equipment without specific approval of the commanding officer.
38. Never open or close electrical switches and pipe valves unless authorized to do so.
40. Ensure that low overheads above inclined ladders (72") and passageways (75") and obstructions in passageways are padded, and hazardous areas around machinery and elevators are color coded to warn people of danger areas.

41. Rig heavy weather lifelines prior to expected inclement weather.
42. When working in a tank or void, ensure that you have a safety line attached.

REFERENCE: OPNAVINST 5100.19B, VOLUME II, CHAPTER C1

HANDOUT #1- BASIC SAFETY STANDARDS (SUBMARINE)

Shipboard life is one of the most hazardous working and living environments that exists. The existence of hazardous materials and equipment, in addition to the fact that a ship is a constantly moving platform subject to conditions such as weather, collision, and grounding contribute to an accident prone environment. Any chain of events could lead to a major catastrophe. It is for this reason, PRACTICAL SAFETY must be followed and the prescribed safety regulations strictly followed to prevent personal injury and illness.

The general safety standards in the following section are applicable to all shipboard operations and spaces.

GENERAL SAFETY STANDARDS

Complying with the following standards may save your life:

1. Locate and remember all exits from working and living spaces.
2. Know where life jackets and Steinke hoods are stored.
3. Make sure that all movable objects are properly secured for sea.
4. Always wear clothing that snugly fits your body.
5. Whenever practicable, carry a load in a manner which allows one hand to be free.
6. Always move up or down a ladder with one hand on the railing.
7. Know the emergency shut down procedures for all equipment you operate.
8. Always ensure exits are not blocked with equipment or boxes.
9. Always ensure ventilation ducts are free of blockage.
10. Never horseplay on board ship.
11. Rings, watches, key rings, and other items that may become entangled or caught on projections should not be worn.
12. Always wear approved safety shoes when required by the job.

13. Carry as little in your pockets as possible.
14. Walk, don't run in passageways.
15. Always be cautious when nearing a "blind" corner.
16. Know the location of submarine escape equipment for all escape stations and know how to conduct an escape from each escape station.
17. Know the location of all fire stations and other firefighting equipment throughout the ship.
18. Keep constantly familiar with the whereabouts of crew members in the space where you are working, especially if they are working in tanks or other restricted movement areas.
19. Smoke only in designated areas.
20. Equipment shall be operated only by authorized personnel and in an authorized manner.
21. Sunglasses shall only be worn topside.
22. If you pass through a watertight door designated to be closed during normal operations, be certain that it is properly closed.
23. Know where life rings, markers, and flares are located for man overboard emergencies.
24. Know all areas where protective equipment should be worn.
25. Promptly inform senior personnel responsible for a given space or equipment of all unsafe conditions discovered.
26. Do not lean against lifelines.
27. Keep decks free of obstacles and materials causing slippery conditions, particularly in work areas. Areas that are slippery shall be posted with a warning sign.
28. Provide temporary protection by guardrails or chains, suitably supported by stanchions or pads, when opening accesses in bulkheads or decks which are normally closed.

29. Never straddle or step over lines, wire, and chains under tension.
30. After opening and prior to passing through a watertight door, hatch, scuttle, or manhole cover, ensure hatch brace pins and/or safety pawls and scuttle/manhole covers are positively locked.
31. Wear an inherently buoyant life-jacket and approved topside shoes topside where the potential exists of falling, slipping, being thrown, or carried into the water. Safety harnesses shall be worn by all personnel on the main deck while underway, except during the maneuvering watch, or unless otherwise specified by the commanding officer.
32. Never dismantle or remove any lifeline, or hang or secure any weight or line to any lifeline except as authorized by the commanding officer.
33. Never dismantle or remove any inclined or vertical ladder without permission of the commanding officer. Such areas shall be secured with temporary lifelines and shall be posted with a warning sign.
34. Never operate machinery or equipment with defective safety devices.
35. Never tamper with or render ineffective any safety device, interlock, ground strap or similar device intended to protect operators or the equipment without specific approval of the commanding officer.
36. Never open or close electrical switches and pipe valves unless authorized to do so.
37. Ensure that low overheads above inclined ladders (72") and passageways (75") and obstructions in passageways are padded, and hazardous areas around machinery are color coded to warn people of danger areas.

REFERENCE: OPNAVINST 5100.19B, VOLUME III, CHAPTER D1

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____/LG #1_____ LENGTH_____ 30 MINUTES_____

SUBJECT OCCUPATIONAL SAFETY AND HEALTH PROGRAM

REFERENCE: (a) OPNAVINST 5100.19B, Section A

OBJECTIVES:

- (1) To introduce the NAVOSH Program
- (2) To indicate the references governing the NAVOSH Program
- (3) To understand how safety and health regulations are established and implemented in the Navy
- (4) To understand the Navy's safety and health goals, and responsibilities
- (5) To introduce their command's safety and health program

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) Weekly message Summary of Mishaps, if available
- (2) FLASH magazine, published by the Naval Safety center, if available

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use audiovisual aid "NAVOSH - It's Protecting You" (804764-DN), if available. Have a copy of OPNAVINST 5100.19B Volumes I and III available to show students. Use LG #1 from NAVOSH Training Guide for Forces Afloat, and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____/LG #2 _____LENGTH _____ 30 MINUTES

SUBJECT HEAT STRESS PROGRAM (NON-SUPERVISORY)

REFERENCE: (a) OPNAVINST 5100.20C
(b) NAVMED P-5010-3
(c) OPNAVINST 5100.19B, Chapter B2

OBJECTIVES;

- (1) To identify sources and causes of heat stress
- (2) To understand the symptoms and first aid for heat-related illness
- (3) To become familiar with the terms WBGT, PHEL and why we monitor heat stress areas
- (4) To recognize that they should notify their supervisor of potential heat stress conditions
- (5) To become familiar with the Navy's Heat Stress Program

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use the audiovisual aid "Heat Stress Monster" (35025-DN), if available. Use LG #2 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce HANDOUT #1 - Heat Stress First Aid for distribution. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____/LG #3_____ LENGTH _____ 30 MINUTES_____

SUBJECT _____ HEAT STRESS PROGRAM (SUPERVISORY)_____

REFERENCES: (a) OPNAVINST 5100.20C
(b) NAVMED P-5010-3
(c) OPNAVINST 5100.19B, Chapter B2

OBJECTIVES:

- (1) To identify the causes of heat stress, symptoms of heat illness and the first aid procedures.
- (2) As a supervisor, to understand stay-times and recovery times as they apply to their workers.
- (3) To be familiar with the terms WBGT and PHEL, and how to determine PHEL stay-times.
- (4) To understand the Navy's and their command's Heat Stress Program, when WBGT surveys are required, and the reporting procedures.

THEORY TO PRACTICE:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use audiovisual aid "If You Can't Stand the Heat" (35026-DN), if available. Use LG #3 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce Handouts #1 and #2 for distribution to students. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____/LG #5 _____ LENGTH _____ 30 MINUTES _____

SUBJECT HEARING CONSERVATION PROGRAM

REFERENCE: (a) OPNAVINST 5100.19B, Chapter B4

OBJECTIVES:

- (1) To identify the types and causes of hearing loss
- (2) To become familiar with the Navy's Hearing Conservation Program
- (3) To understand hearing protection and its uses
- (4) To understand the reasons for conducting hearing tests or audiograms

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use audiovisual aid "Hearing Conservation- Shipboard" (43138-DN), if available. Use LG #5 from the NAVOSH Training Guide for Forces Afloat. Have samples of hearing protection available to show students. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____/LG #6 _____ LENGTH _____ 30 MINUTES

SUBJECT SIGHT CONSERVATION AND EYE SAFETY

REFERENCE: (a) OPNAVINST 5100.19B, Chapter B5

OBJECTIVES:

- (1) To be able to identify eye hazards
- (2) To select the proper eye protection for the hazard
- (3) To understand the uses of emergency eye wash stations and deluge showers
- (4) To understand the first aid for eye injuries
- (5) To become familiar with the Navy's Sight Conservation Program

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use audiovisual aid "Caution - Eyes at Work" (21760-DN) or "Straight Talk on Eye Safety" (22070-DN), if available. Use LG #6 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce Handout #1 - Types of Protective Eyewear. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____ /LG #7 _____ LENGTH _____ 60 MINUTE _____

SUBJECT ELEMENTS OF THE RESPIRATORY PROTECTION PROGRAM

REFERENCE: (a) OPNAVINST 5100.19B, Chapter B6

OBJECTIVES:

- (1) To understand the basic elements of the respiratory protection program
- (2) To understand respirator selection, care and maintenance
- (3) To become familiar with fit-testing procedures
- (4) To understand the command's respiratory protection program and situations requiring respirators during submarine upkeep

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use the audiovisual aid "Shipboard Respiratory Protection for the User" (805009-DN), if available. Use LG #7 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce Handout #1- Respiratory Protection Program for distribution. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER / LG #8 LENGTH 60-90 MINUTES

SUBJECT ELECTRICAL SAFETY AND TAG-OUT PROGRAM

REFERENCES:

- (a) OPNAVINST 5100.19B, Chapter B7
- (b) OPNAVINST 3120.32B
- (c) NSTM, Chapter 300
- (d) TYCOM and ship's electrical safety directive

OBJECTIVES:

- (1) To understand the dangers of electrical shock and first aid procedures for electrical shock
- (2) To understand the shipboard electrical system and precautions
- (3) To be familiar with procedures for electrical tool issue and safe use of electrical/electronic equipment
- (4) To understand the safety checks required for personal electrical and electronic equipment
- (5) To understand the purpose of the tag-out program and be able to recognize various tags
- (6) To be familiar with the Navy's and the command's electrical safety program

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES :

Use the audiovisual aid "Electrical Safety" (805008-DN) and "Shipboard Tag-Out Procedures" (805081-DN), if available. Use LG #8 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce Handouts #1-3 for distribution. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER /LG #9 LENGTH 30 MINUTES

SUBJECT ASBESTOS HAZARDS AND EXPOSURE CONTROL

REFERENCE: (a) OPNAVINST 5100.19B, Chapter B1
(b) NSTM, Chapter 635

OBJECTIVES:

- (1) To identify the health hazards associated with exposure to asbestos
- (2) To be aware of precautions and special handling required in dealing with asbestos aboard submarines
- (3) To understand the Navy's asbestos control program and the requirements for submarines with installed asbestos insulation
- (4) To become familiar with the Asbestos Medical Surveillance Program (AMSP) and how it affects previously exposed personnel
- (5) To understand the concept of emergency asbestos rip-out teams, protective clothing requirements, and safe procedures for emergency asbestos removals

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use the audiovisual "Asbestos at the Worksite" (68164-DN), if available. Use LG #9 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce Handout #1 for distribution. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER /LG #10 LENGTH 60 MINUTES

SUBJECT HAZARDOUS MATERIAL/HAZARDOUS WASTE PROGRAM

REFERENCE:

- (a) OPNAVINST 5100.19B, Chapter B3 and C23
- (b) OPNAVINST 5090.1A, Chapter 17
- (c) NSTM, Chapter 670
- (d) NSTM, Chapter 593

OBJECTIVES:

- (1) To be able to define hazardous material and hazardous waste
- (2) To understand the Navy's hazardous waste minimization program
- (3) To understand the interface between the Atmosphere Control Program and the Hazardous Materials Program
- (4) To understand the general handling, storage and disposal requirements for hazardous materials

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use the audiovisual aids "Hazardous Materials Control Afloat" (804939-DN); "Handling of Hazardous Materials Afloat" (803475-DN); "Storage of Hazardous Materials Afloat" (803476-DN); and/or "Disposal of Hazardous Materials Afloat" (803495-DN), if available. Use LG #10 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce Handout #1 for distribution. Locally reproduce and administer the 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____/LG #11_____ LENGTH 30 MINUTES_____

SUBJECT USE AND CARE OF PERSONAL PROTECTIVE EQUIPMENT

REFERENCE: (a) OPNAVINST 5100.19B, Chapter B12

OBJECTIVES:

- (1) To understand the purpose, selection and care of personal protective equipment
- (2) To be able to identify the various types of personal protective equipment and their uses
- (3) To become familiar with the command's procurement and issue policies for personal protective equipment

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSON LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use the audiovisual aid "A Simple Choice" (35142-DN) or "The Color of Danger" (22086-DN), if available. Use LG #11 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____/LG #14_____ LENGTH _____ 30 MINUTES_____

SUBJECT TRAFFIC SAFETY PROGRAM_____

REFERENCE: (a) OPNAVINST 5100.12 Series

OBJECTIVES:

- (1) To understand the Navy's Traffic Safety Program requirements and regulations
- (2) To understand the seat belt regulations, motorcycle safety regulations and enforcement policies
- (3) To understand how the Traffic Safety Program applies on and off base, on and off duty

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use the audiovisual aid "Room To Live" (52568-DN) or "Deadliest Weapon in America" (606348-DN), if available. Use LG #14 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____ / LG #15 _____ LENGTH _____ 30 MINUTES _____

SUBJECT RECREATION, ATHLETICS AND HOME SAFETY

REFERENCE: (a) OPNAVINST 5100.25

OBJECTIVES:

- (1) To familiarize the student with the Navy's Recreation, Athletic and Home Safety Program
- (2) To understand how off-duty safety affects readiness and personnel losses
- (3) To understand the command's responsibilities in the Recreation, Athletic and Home safety Program

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use audiovisual aid "In a Fire Seconds Count" (22101-DN), "Must We Fall- Slips, Trips and Falls" (504320-DN), "Physical Fitness and Sports" (803506-DN), or "Smoking Prevention and Cessation" (803504-DN), if available. Use LG #15 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce Handout #1 and distribute. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER / LG #17 LENGTH 30 MINUTES

SUBJECT LEAD SAFETY PROGRAM

REFERENCE: (a) OPNAVINST 5100.19B, Chapter B10
(b) 29 CFR 1910.1025

OBJECTIVES:

- (1) To understand the health hazards associated with lead exposure and sources of lead on Navy ships
- (2) To understand the work procedures and precautions where there is potential for lead exposure
- (3) To understand the medical surveillance requirements for lead workers

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES :

Use the audiovisual "Lead Dust" available from the parent submarine tender Repair Department (#NW0446-85-07). Use LG #17 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____ / LG #18 _____ LENGTH _____ 30 MINUTES _____

SUBJECT BACK INJURY PREVENTION

REFERENCE: (a) OPNAVINST 5100.19B, Chapter A4
(b) US Navy Way to a Healthy Back
(NSN 0506-LP-800-0780)
(c) About Back Problems (NSN 0506-LP-800-0070)

OBJECTIVES:

- (1) To understand the nature of back injuries
- (2) To become familiar with back injury prevention techniques and safe lifting procedures
- (3) To understand how exercise contributes to back injury prevention
- (4) To understand the first aid for back injuries

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use the audiovisual aid "Back Injury Prevention" (803503-DN), if available. Use LG #18 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce Handout #1 and distribute. Locally reproduce and administer 10 question quiz.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____ / LG #19 LENGTH _____ 30 MINUTES

SUBJECT MISHAP INVESTIGATION AND REPORTING

REFERENCE: (a) OPNAVINST 5100.21A
(b) OPNAVINST 5100.19B, Chapter A6
(c) OPNAVINST 5102.1C

OBJECTIVES:

- (1) To understand the need for mishap investigations and reports required
- (2) To become familiar with the types of reportable mishaps
- (3) To understand the function of the formal mishap investigation boards
- (4) To understand the concept of privileged information and how it pertains to safety investigations

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use LG #19 from the NAVOSH Training Guide for Forces Afloat. Locally reproduce and administer 10 question quiz and handouts.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)

TRAINING REQUIREMENTS PAGE

TRP NUMBER _____ / LG #20 _____ LENGTH _____ 30 MINUTES _____

SUBJECT INDOCTRINATION DIVISION (I-DIV) SAFETY TRAINING

REFERENCE: (a) OPNAVINST 5100.19B, Chapter A7

OBJECTIVES:

- (1) To become familiar with the command safety program
- (2) To understand the safety chain of command and key players on board
- (3) To become familiar with the general occupational safety and health program, back injury prevention, electrical safety and tag-out programs

THEORY TO PRACTICE TOPICS:

- (1) None

RELATED INCIDENT REPORTS/LESSONS LEARNED:

- (1) None

LOGS AND PLOTTED DATA:

- (1) Not applicable

NOTES:

Use the audiovisuals listed in LGs #1, 8 and 18. Locally reproduce the handouts and quizzes, if desired.

SUBMITTED _____ REVIEWED _____ APPROVED _____
(DIV OFFICER) (DEPT HEAD)